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AUTHOR Gilmore, Arthur W.
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ABSTRACT

Information on the placement status of 1980 engineering and technology graduates is presented. At the doctoral degree level, the percentage without job offers or other firm plans was lower than in 1979. The bachelor's degree level experienced a one percentage point reduction in the number of graduates employed as of graduation compared to 1979, and the master's degree level dropped by 2 percent in the number of graduates employed at graduation. The job prospects for four-year engineering technology graduates, including those returning to a job as well as those considering job offers, were improved over 1979. For graduates electing to continue their education, the majority at all degree levels selected a technical rather than a nontechnical program. Information is also presented on the associate-level technology graduate, average monthly starting salaries of new engineering and technology graduates, placement status of graduates by specific field of study, placement status of women and minority engineering and technology graduates, and enrollment and degree trends in engineering from the 1950s through 1979. An additional feature of the 1980 survey was questions relating to the current concerns about U.S. productivity and innovation. Of the 212 schools reporting, 9 percent stated that they were currently offering coursework in innovation and entrepreneurship. Another 7 percent indicated that such instruction was either currently offered as a part of ongoing courses in other areas or that they were now planning to offer such courses. A copy of the survey questionnaire, on which the results for all schools and degree levels are presented, is appended. (SW)

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PLACEMENT OF ENGINEERING

AND

TECHNOLOGY GRADUATES

1980

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A Commission of the Engineering Affairs Council
of the
American Association of Engineering Societies
345 East 47th Street
New York, New York 10017

HE 013 505

December 1980

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The surveys on which this report is based were coordinated by the Engineering Manpower Commission staff under the overall direction of Patrick J. Sheridan, Manager of Manpower Activities, American Association of Engineering Societies. The survey was conducted and statistics computed by Arthur W. Gilmore, a consultant to the Engineering Manpower Commission, who also prepared the text of this report.

We owe particular thanks to all of the Deans and Placement Directors who responded to this survey. Their cooperation in providing the basic source data is essential to the production of these annual placement reports on engineering and technology graduates.

CONTENTS

PAGE

The Overall Picture..... 3
Bachelor Degree Engineering Graduates..... 9
Bachelor Degree Technology Graduates..... 12
Master Degree Engineering Graduates..... 16
Doctor Degree Engineering Graduates..... 19
Associate Degree Technology Graduates..... 21
Placement Status of Women & Minority Engineering & Technology Graduates.... 26
Enrollment and Degree Trends..... 28
Entrepreneurship and Innovation..... 33
Appendix-Participants in the 1980 EMC Placement Survey..... 36
Questionnaire Forms and Summary Data..... 38

FIGURES

1. Placement Status of Engineering Graduates 1980..... 2
2. Placement Status of Technology Graduates 1980..... 3
3. Average Monthly Starting Salaries of New Engineering and Technology Graduates 1964-1980..... 5
4. Placement Status of BS Engineering Graduates 1964-1980..... 8
5. Placement Status of Bachelor of Technology Graduates 1969-1980..... 12
6. Placement Status of MS Engineering Graduates 1972-1980..... 16
7. Placement Status of PhD Engineering Graduates 1972-1980..... 19
8. Placement Status of Associate Degree Technology Graduates 1969-1980.... 21
9. Freshman Enrollments and Bachelor Degrees in Engineering..... 29
10. Engineering Master and Doctor Degrees..... 29

TABLES

1. Comparative Distribution of College Graduates Versus Hires for Selected Major Fields 1979-1980 School Year..... 7
2. Placement Status of Bachelor Degree Engineering Graduates 1980 Compared with Previous Years..... 8
3. Placement Status of Engineering Graduates 1980..... 9
4. Placement Status of Bachelor Degree Graduates by Engineering Curriculum 1980..... 10
5. Starting Salary Offers to 1980 Graduates, Bachelor's Degree Level..... 11
6. Starting Salaries Accepted By 1980 Engineering Graduates..... 11
7. Placement Status of Bachelor Degree Technology Graduates 1980 Compared with Previous Years..... 13
8. Placement Status of Bachelor Degree Technology Graduates by Curriculum 1980..... 13
9. Placement Status of Bachelor Degree Technology Graduates 1980, ABET Accredited and Non-Accredited Schools..... 14
10. Monthly Starting Salaries of 1980 Technology Graduates, Bachelor Degree Level..... 14
11. Placement Status of Master Degree Engineering Graduates-1980 Compared with Previous Years..... 16
12. Placement Status of Engineering Graduates by Curriculum-1980 Master Degree Programs..... 17
13. Starting Salary Offers to 1980 Graduates, Master Degree Level..... 17
14. Placement Status of Doctor Engineering Graduates-1980 Compared with Previous Years..... 19
15. Placement Status of Engineering Graduates by Curriculum-1980 Doctor Degree Programs..... 20
16. Starting Salary Offers to 1980 Graduates, Doctor Degree Level..... 20
17. Placement Status of Associate Degree Technology Graduates 1980 Compared with Previous Years..... 21
18. Placement Status of Associate Degree Technology Graduates-1980, ABET Accredited and Non-Accredited Schools..... 22
19. Placement Status of Technology Graduates by Curriculum 1980 Associate Degree Programs, All Schools..... 22
20. Placement Status of Technology Graduates by Curriculum 1980 Associate Degree Programs, ABET Schools..... 23
21. Placement Status of Technology Graduates by Curriculum 1980 Associate Degree Programs, Non-ABET Schools..... 24
22. Monthly Starting Salaries of 1980 Technology Graduates, Associate Degree Level..... 25
23. Placement Status of Women and Minority Graduates 1980, Bachelor Degree in Engineering..... 26
24. Engineering Enrollments and Degrees..... 30
25. Bachelor of Technology Degrees..... 31
26. Two-Year Technology Degrees..... 32

PLACEMENT STATUS OF ENGINEERING GRADUATES 1980

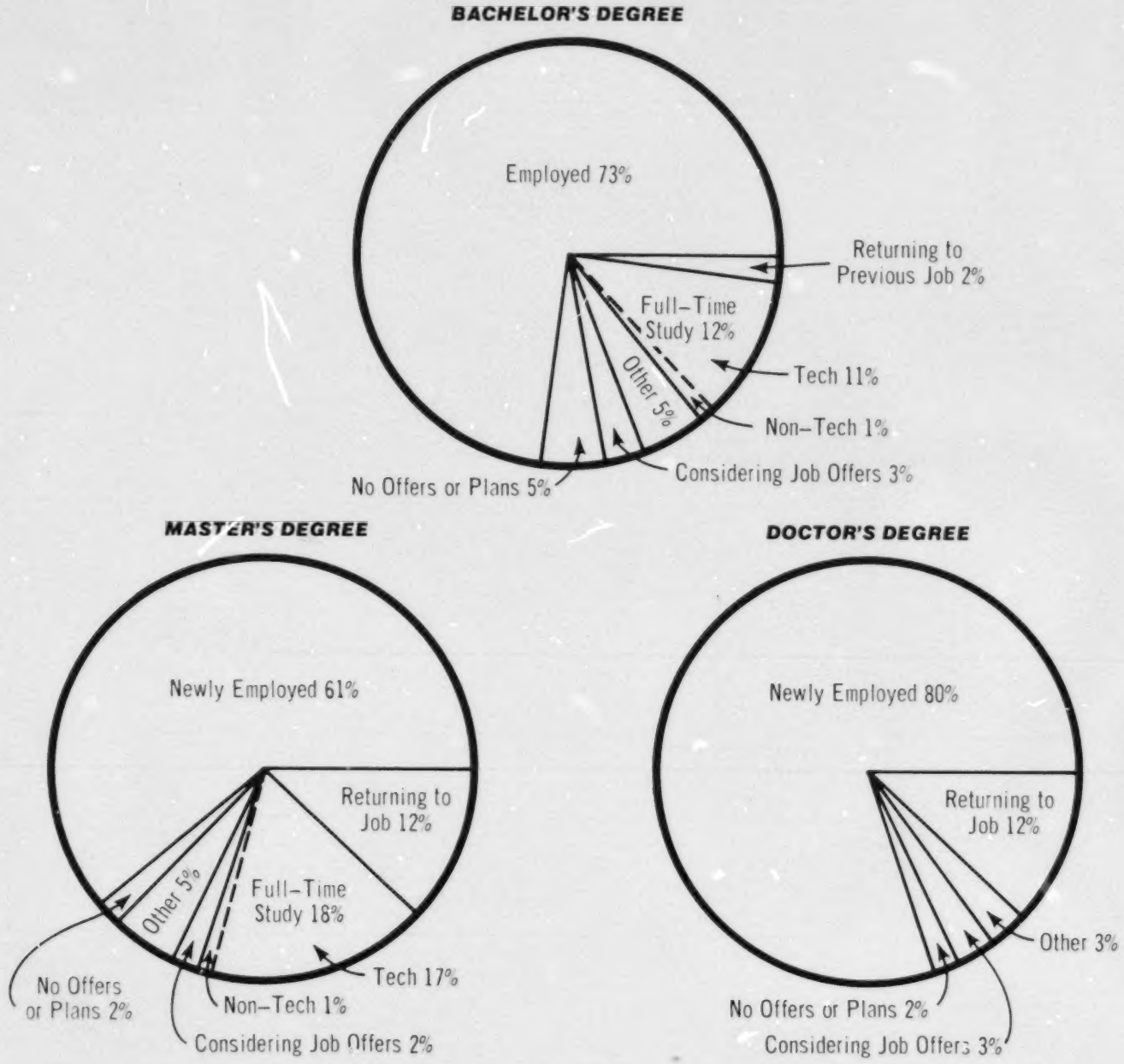


FIGURE 1

THE OVERALL PICTURE

Engineering and technology graduates of the class of 1980 entered one of the most favorable job markets since the early 1960's, according to the results of the 21st annual placement survey conducted by the Engineering Manpower Commission of the American Association of Engineering Societies. The survey compiled data on 37,125 engineering and technology graduates from U.S. schools, which are listed in the Appendix along with the summary data on which this report is based.

The placement status of engineering graduates at each degree level is shown graphically in Figure 1. At the doctor's degree level, the percentage without job offers or other firm plans was lower than last year's figures. The bachelor's degree level experienced a one percentage point reduction in the number of graduates employed as of graduation compared to 1979. While the number of master's degree graduates employed at graduation dropped by 2 percent compared to last year, the number without offers or other plans was also 1 percent lower. In this regard, the fact that an engineering or technology graduate did not have a job as of the date of graduation does not necessarily mean that he or she was doomed to longterm unemployment. Placement officers regularly report that many new graduates wish to remain uncommitted through the summer and that by fall practically all new engineers actively seeking work have found jobs.

The job prospects for four-year engineering technology graduates, including those returning to a job as

PLACEMENT STATUS OF TECHNOLOGY GRADUATES, 1980

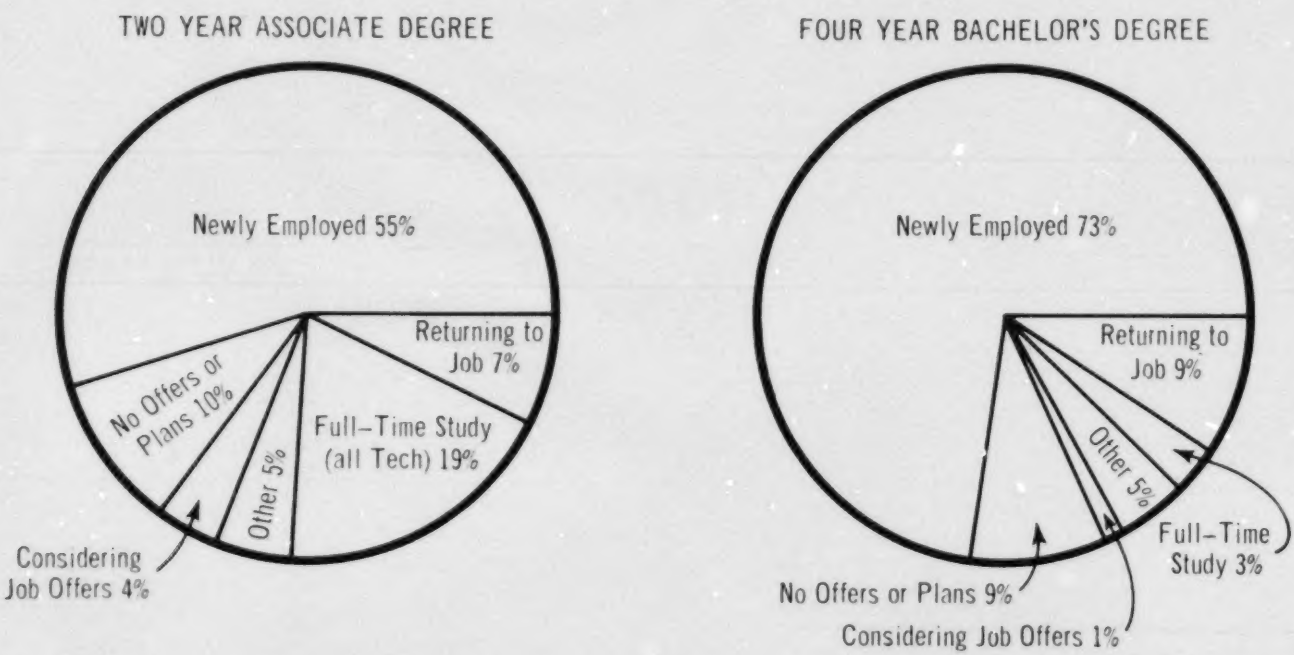


FIGURE 2

well as those considering job offers, were improved over 1979. The 1980 survey results for technology graduates are shown in Figure 2.

The EMC survey seeks to ascertain the placement status of engineering and technology graduates as of the date of graduation, which varies from school to school. The survey data are gathered from placement officers and deans, not from students themselves. Respondents are also asked not to report on evening students (who are presumably employed during the day) and foreign students (who are required by the terms of their visas to return to their home countries and not to accept employment in the U.S.).

Many students at the master and doctor levels, other than those in evening programs, are engineers who have worked for various periods before returning to school for advanced study, and fairly substantial numbers of these are reported as returning to jobs previously held. A similar upgrading of formal education is taking place at the bachelor and associate degree levels in both engineering and technology. It should be noted that the existence of significant numbers of foreign and already-employed students in engineering and related programs means that many graduates are not in the job market. The supply of new engineering manpower is less than the number of degrees earned might imply. The reduction in job-seeking graduates makes the prospects for new engineers and technologists more favorable than the statistics indicate.

The major placement categories identified in the EMC survey are, of course, employment and continued education. In connection with the latter, it was considered important again this year to find out whether the individual elects a technical or non-technical graduate program. The results shown in Figure 1 indicate the choice to be predominantly technical at all degree levels. Comparisons to last year's figures show the breakdown for those graduating with a bachelor's degree to be the same, whereas there was an increase of those electing technical over non-technical graduate programs at the master's degree level.

Other categories shown on this year's questionnaire form were "Other Plans - Not Seeking Employment," "No Job Offers or Other Plans - Seeking Employment," and "Has Job Offer But Still Undecided." These categories provided a clear distinction between students in and out of the job market. Students about whom no information was known by the placement office were listed as "No Information Available" and were recorded in order to assure completeness of the data reported. These data, however, are not counted in computing the statistics. We have found in past surveys that the statistics tend to remain constant within a percentage point or two regardless of whether or not schools with a high proportion of "No Information Available" graduates were counted. Data on some programs that were too small to provide usable percentages are included in the summary tables in the Appendix.

While there is no single measure of success in the placement of new graduates, other indicators confirm that 1980 was a very good year. Starting salaries continued to move upward with average increases varying from 8 percent for bachelor degree technology graduates to 11.6 percent for associate degree technology graduates, while the Consumer Price Index rose by 13.2 percent during the year.[1] Starting salary trends from 1963 to date are shown graphically in Figure 3. A noteworthy feature is the extent to which the curves for the different degree levels have appeared to remain parallel over the years, except for the

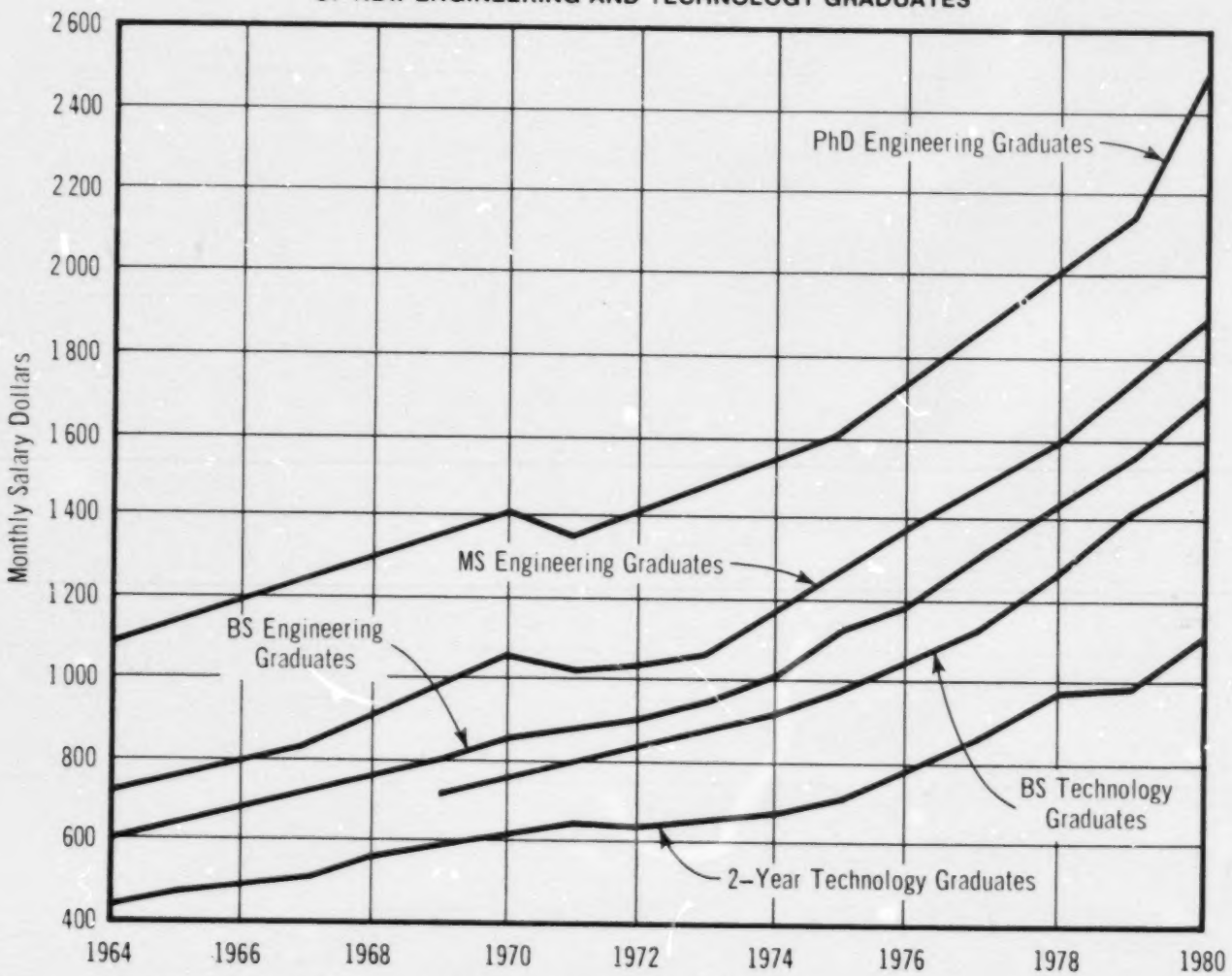
[1] Consumer Price Index for all consumers based on new index 1967 = 100. Data reported are for the change from July, 1979 to July, 1980.

gradual divergence of the technology curves especially that for the two-year associate degree graduates.

The actual dollar differentials between bachelor's and master's, and master's and doctor's degree levels have tended to increase only slightly, while the percentage differentials have decreased. Between 1964 and 1980 the premium for a master's degree over a bachelor's degree in engineering dropped from 22 percent to 11.2 percent, while that for a doctor's degree relative to a master's fell from 42 percent to 30.5 percent. By contrast, the advantage of a bachelor's degree in engineering over a two-year associate's degree in technology increased; it was 47 percent higher in 1964 and 53.8 percent higher in 1980. The bachelor of technology degree now appears to be finding a place roughly 10 to 13 percent below the bachelor's in engineering, even though the dollar spread seems to have widened slightly since 1974.

Women engineering graduates, who constituted about nine percent of the

AVERAGE MONTHLY STARTING SALARIES OF NEW ENGINEERING AND TECHNOLOGY GRADUATES



Source: Engineering salaries adapted from annual surveys by the College Placement Council, Inc. Technology salaries from annual surveys by the Engineering Manpower Commission.

FIGURE 3

bachelor degrees earned in 1980, continued to enjoy higher salary offers than their male classmates. According to the College Placement Council, Inc.[2], average offers were about 1.8 percent higher for women engineers than for men and came to over $20,000 per year for new graduates without prior work experience. In 1979, the average offers for women were about 2.2 percent higher than for men. The decrease in the percentage differential indicates a leveling effect, probably caused by more women entering the field.

Data on starting salaries of associate degree and bachelor of technology graduates were collected directly by EMC from schools participating in the placement survey, and represent starting salaries accepted rather than offered. For the first time, this year's survey requested salary acceptance data on bachelor's, master's, and doctorate program graduates as well. Analysis of this data showed generally good agreement with the data supplied by CPC and shown in Table 5 for the bachelor's degree except in the case of civil engineering. According to the EMC survey, the average accepted salary for civil engineering was $1,570 per month compared to the average offer of $1,554 per month reported by CPC. The schools that provided placement and salary data are identified in the Appendix.

As usual, the employment picture varied significantly from one specialty to another. As a generalization based on the combined evidence of placement statistics, starting salary offers, and other relevant information, the market was strongest for petroleum, chemical, mechanical, and electrical engineers, while weakness was most evident in the engineering science and general engineering categories. However, the patterns were not consistent at all degree levels. These results are obviously related to conditions in the U.S. economy and specific matters of current national priority. Other differences will be pointed out in the discussion of the detailed statistics for each degree level.

Few statistics are available on the placement status of other groups, and published data provide only a rough means of comparison. The College Placement Council has reported the number of hires made in four general fields -- engineering, science and mathematics, business, and non-technical -- but its reports do not cover such areas as teaching, law and health care professions.[3] The distribution of hires shows that engineers accounted for 36 percent of those at the bachelor level, 24 percent at the master level and 39 percent at the doctor level. Taking the distribution of degrees earned in the same four fields as estimated from data compiled by the National Center for Education Statistics of the U.S. Department of Education,[4] only six percent of the bachelor's degrees, five percent of the master's, and seven percent of the doc-

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[2] CPC Salary Survey: A Study of Beginning Offers. Final Report July, 1980. The College Placement Council, Inc., P.O. Box 2263, Bethlehem, PA 18001 published its reports as a service to members and subscribers only. The beginning salary data reported are based on offers (not acceptances) made by business, industrial, and government employers to graduating students in selected curricula and graduate programs during the normal college recruiting period, September to June. The data are submitted by a representative group of colleges throughout the United States. Contact CPC for subscription information. Selected data used by permission.

[3] Recruiting 80: A Special Report for CPC Members, June, 1980.

[4] Projections of Education Statistics to 1985-86, U.S. Government Printing Office, Washington, D.C., 1977.

TABLE 1

COMPARATIVE DISTRIBUTION OF COLLEGE GRADUATES VERSUS HIRES FOR SELECTED MAJOR FIELDS, 1979-80 SCHOOL YEAR

Field	Bachelor's		Master's		Doctor's	
	% Degrees	% Hires	% Degrees	% Hires	% Degrees	% Hires
Engineering	6	36	5	25	7	39
Science & Math	13	15	7	19	24	57
Business	16	38	15	50	3	2
Other Non-Technical	65	11	74	7	66	2

Source: Degrees estimated from Projections of Education Statistics to 1990-91, National Center for Education Statistics.
Hires derived from Recruiting 80: A Special Report for CPC Members, by the College Placement Council, Inc., June, 1980.

torates were in engineering. Table 1 gives the statistics showing this comparison, which reveals the favorable employment situation for engineers and graduates of business programs as compared to other groups of new graduates.

Other economic indicators of engineering employment were not as favorable. For the overall job market, U.S. Department of Labor statistics showed an unemployment rate for engineers of 1.4 percent as of the second quarter of 1980, up from the 1.2 percent average of 1979.

The average Deutsch, Shea & Evans index for 1979 under the new revised method was 144. This revised index, comparing June, 1979 with June, 1980, showed a decrease in demand of 8.9 percent. The Deutsch, Shea & Evans index is a measure of high technology demand based on the amount of classified ads appearing in newspapers and technical journals.

The employment climate improved during the 1979-80 school year. The College Placement Council reports that the hiring plans of business and industry for engineering graduates were up significantly over previous years. While increased demand was also reported for most other fields, engineering clearly held the lead.

Increasing enrollments in recent years (see Figure 9 and Table 24) make larger graduating classes at the bachelor level a certainty for the next four or five years. In 1979 the class increased by 14.4 percentage points. Although there were 52,598 graduates, no drop in relative demand occurred. The master level showed a decrease of 3.4 percent and the number of doctor degree graduates increased 9.4 percent.

Next year's engineering employment climate will continue to be influenced by political and economic decisions, not to mention continuing concern about inflation, the international balance of trade, and the stability of the world economy in general. Increased government appropriations for defense, energy and other R&D programs should stimulate demand. However, a substantial increase in the number of graduates could result in stiffer competition for jobs and fewer opportunities for choice on the part of the average engineering graduate. Since the supply of new engineers with advanced degrees shows little evidence of increasing appreciably, the job prospects for master and doctor recipients are not likely to be different from this year's experience.

A more detailed discussion of the placement results at each of the five degree levels covered by the EMC survey appears in the sections which follow.

TABLE 2

PLACEMENT STATUS OF BACHELOR'S DEGREE ENGINEERING GRADUATES 1980 COMPARED WITH PREVIOUS YEARS

Placement Status	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Employed**	59%	60%	54%	64%	68%	71%	64%	52%	54%	62%	67%	58%	58%	69%	75%	76%	75%
Entering Graduate Studies**	17	25	26	25	18	16	17	20	20	19	17	19	18	16	13	12	12
Entering Military Service***	9	8	7	9	11	9	11	14	9	5	4	4	3	***	***	***	***
Other Specific Plans	3	1	1	2	1	*	2	2	2	3	2	3	3	4	4	3	5
Considering Job Offers	10	12	14	2	3	3	4	3	5	6	4	3	3	3	3	6	3
No Offers or Plans	2	1	*	*	*	*	4	9	11	5	6	12	14	8	5	3	5
Total With Status Known	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

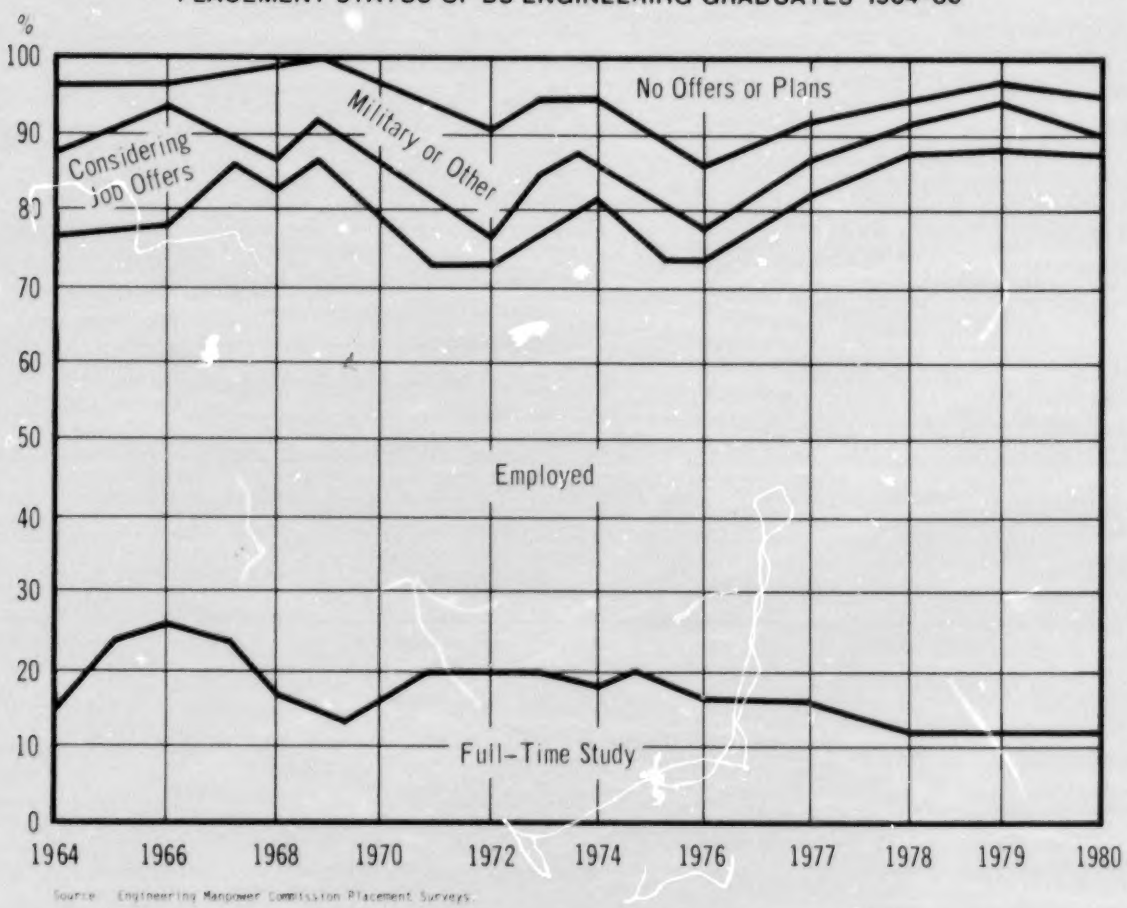
* Less than 1%

** For 1965 through 1974, those employed and entering full-time graduate studies sponsored by employer were included in both categories.

*** Combined with Other Specific Plans starting in 1977.

NOTE: Percentages may not add to totals because of rounding.

PLACEMENT STATUS OF BS ENGINEERING GRADUATES 1964-80



Source: Engineering Manpower Commission Placement Surveys.

FIGURE 4

BACHELOR DEGREE ENGINEERING GRADUATES

Table 2 and Figure 4 show how the placement status of graduating engineers at the bachelor level has varied over the years. The effects of the economic boom during the 1960's, the draft between 1965 and 1968, the aerospace recession in 1970-72, the start of recovery in 1973, and the energy and inflation problems of recent years are readily apparent. This year, the percentage without job offers or other plans increased from 3 percent in 1979 to 5 percent. The percentage employed decreased from 76 percent in 1979 to 75 percent in 1980, while the proportion going on to graduate school held constant. Other specific plans claimed five percent of this year's graduates, while another three percent were still debating whether to accept job offers. Variations of one or two percentage points in most of the categories can result from minor differences in survey coverage each year or even from rounding off the statistics, but over a span of years, real trends are evident. A more detailed breakdown of the 1980 data comparing degree levels is given in Table 3.

Military service has now become so small a factor in engineering placement that EMC no longer reports it as a separate category, but includes it with "Other Specific Plans." The percentage of graduates still considering job offers at mid-summer had remained constant at 3 percent from 1975 through 1978, doubled in 1979, then fell back to 3 percent in 1980.

Table 4 gives the breakdown by major curriculum. Some of the statistics are based on rather small numbers of returns (see Appendix) and should be interpreted with caution, especially when looking at changes from year to year. They also should not be used as a basis for concluding that one curriculum is to be favored over another without taking other factors into consideration. Among trends that have been relatively consistent over the years is a tendency for graduates in the engineering sciences, general engineering, nuclear engineering, and "all other" engineering categories to continue on toward advanced degrees. Recently, ceramic engineering graduates have also shown a preference for further study, but none of the petroleum graduates fell into this category, a fact which is explained in considerable part by the high salaries now being offered in that field.

In 1979, architectural, civil, engineering science, and systems engineering had the highest percentages without job offers or other plans. The 1980 placement survey showed a continuation of the trends shown in the 1979 survey for architectural engineering, which increased from 7 to 27 percent and ceramic engineering, which went

TABLE 3

PLACEMENT STATUS OF ENGINEERING GRADUATES—1980

Placement Status	BS No.	BS %	MS No.	MS %	PhD No.	PhD %
Accepted Job Offer	17498	73	1621	61	529	80
Employed, Returning to Job	479	2	319	12	79	12
Continuing Full-Time Study	2876	12	479	18	*	*
Other Specific Plans	1199	5	133	5	20	3
Considering Job Offers	719	3	53	2	20	3
No Offers, Seeking Work	1199	5	53	2	13	2
Total With Status Known	23970	100	2658	100	661	100
No Information	5273	---	1223	---	251	---
Total Reported	29242	---	3881	---	912	---

NOTE: Percentages may not add to totals because of rounding.

* Equals less than 1%

TABLE 4

PLACEMENT STATUS OF BACHELOR'S DEGREE GRADUATES BY ENGINEERING CURRICULUM, 1980

Placement Status	Aero	Agr	Arch	Ceram	Chem	Civil	Comput	Elec	Eng Sci	Gen
Accepted Job Offer	66%	66%	53%	59%	77%	71%	78%	75%	51%	51%
Employed, Returning to Job	4	*	4	1	1	2	1	3	1	1
Full-Time Study	13	15	7	23	11	12	10	11	35	30
Other Specific Plans	8	6	5	4	4	4	7	5	5	7
Considering Job Offers	6	3	4	1	2	4	1	2	4	6
No Offers, Seeking Work	3	9	27	13	5	6	3	4	4	6
Total With Status Known	100	100	100	100	100	100	100	100	100	100
Number With Status Known	401	320	291	186	3041	3547	726	5376	537	373

Placement Status	Indust	Mat Sci & Eng	Mech	Metal	Mining & Geol	Nucl	Ocean	Petrol	Systems	Other	Total
Accepted Job Offer	76%	69%	78%	67%	73%	60%	57%	98%	71%	70%	73%
Employed, Returning to Job	2	1	1	1	4	*	7	1	*	5	2
Full-Time Study	10	18	10	15	11	7	35	*	20	12	12
Other Specific Plans	4	4	5	5	5	33	*	*	*	5	5
Considering Job Offers	3	2	2	6	2	*	1	*	*	2	3
No Offers, Seeking Work	5	5	4	6	6	*	*	1	10	7	5
Total With Status Known	100	100	100	100	100	100	100	100	100	100	100
Number With Status Known	1077	201	5253	381	1486	15	91	93	51	524	23970

NOTE: Percentages are based on number with status known and may not add to 100% because of rounding.

* Equals less than 1%

from 5 to 13 percent in the "No Offer or Plans" classification. The greatest percentage of unplaced graduates of this year's survey were architectural and ceramic engineering students. Nuclear, ocean, and petroleum engineering showed the smallest numbers without job offers or other plans.

Generally, the proportion of engineers having other specific plans in 1980 remained relatively the same as in 1979, except for nuclear engineering, which increased from 5 to 33 percent. Many of these statistics are based on small numbers of individuals and are subject to considerable fluctuation according to the specific schools reporting each year. The heterogeneous "All Other" category consists of many specialties, some of which may be in strong demand, but, as a general observation, the placement prospects for this group tend to be weaker than average. This is no reason for students to avoid a field in which they have a special interest, but it does pose a warning that demand in supposedly glamorous new specialties may be shallow because only a few employers are able to relate such specialized fields of study to their typical job requirements.

Starting salaries offered to this year's graduates (see Table 5) were up by an average of about ten percent over 1979, with individual curricula increasing variably from 9.5 percent in the case of aeronautical engineering to 11.2 percent for both computer science and electrical engineering. The civil engineering group showed the lowest average offer, while, like last year, the petroleum engineering group received the highest dollar amount which actually exceeded the average for all master degree graduates. (The computer science category as reported by CPC may not be exactly comparable to the cur-

riculum group reported to EMC. All computer science data in the EMC placement survey are for the graduates of engineering school curricula, whereas the CPC survey would also include students from business and other schools whose programs may not be engineering-related.)

This year, for the first time, EMC obtained starting salary acceptances by this year's engineering graduates. The results indicate generally good agreement; it should be noted, however, that curriculum groups were not identical in the two surveys. Actual EMC salary acceptance data by discipline is shown in Table 6.

The figures for women indicate a continuing premium for female engineers, whose numbers are still small in relation to the total graduating class. Women engineers received higher salary offers, but a smaller increase over last year than did men.

TABLE 5

STARTING SALARY OFFERS TO 1980 GRADUATES
BACHELOR'S DEGREE LEVEL

	All Graduates	
	Average Dollars Per Month	Percent Increase Over 1979
Aeronautical Eng.	$1648	9.5
Chemical Eng.	1809	9.7
Civil Eng.	1554	10.8
Electrical Eng.	1690	11.2
Industrial Eng.	1655	11.1
Mechanical Eng.	1703	10.9
Metallurgical Eng.	1726	9.9
Petroleum Eng.	1987	10.8
Men, All Eng. Curricula	1695	10.9
Women, All Eng. Curricula	1725	10.4
Computer Science	1558	11.2

Source: Derived from the College Placement Council, Inc. Salary Survey Final Report, July, 1980.

TABLE 6

STARTING SALARIES ACCEPTED BY
1980 ENGINEERING GRADUATES

Curriculum	BS	MS	PhD
Aeronautical	$1648	$1881	$2268
Architectural	1388	----	----
Chemical	1809	1913	2384
Civil	1570	1775	2051
Computer	1689	1936	2253
Electrical	1699	1906	2352
Mechanical	1710	1898	2289
Metallurgy	1749	1871	2255
Mining, Geol.	1745	1887	1986
Naval, Marine	1657	1936	----
Nuclear	1680	1830	2255
Petroleum	1989	1900	----
Overall	1711	1890	2275

BACHELOR DEGREE TECHNOLOGY GRADUATES

As noted earlier, bachelor of technology graduates were about as successful in finding jobs this year as were graduates of regular engineering programs. Figure 5 and Table 7 show how they have fared over the years. While many parallels can be seen with the trend in engineering, an obvious difference is the small percentage of technologists going on to graduate study. This year's figure was three percent, which represents a minor factor in the placement status of technology graduates.

Table 8, which presents the data broken down by curriculum group, shows that bachelor degree technologists are more likely than engineers to have jobs to which they are returning. Although this category includes only nine percent of the total, it is substantially larger than the two percent indicated for engineering graduates at the bachelor level. In most respects, differences among the curriculum groups were minor. Aerospace technology graduates showed an unusually large increase in the percentage going on for

PLACEMENT STATUS OF BACHELOR OF TECHNOLOGY GRADUATES 1969-80

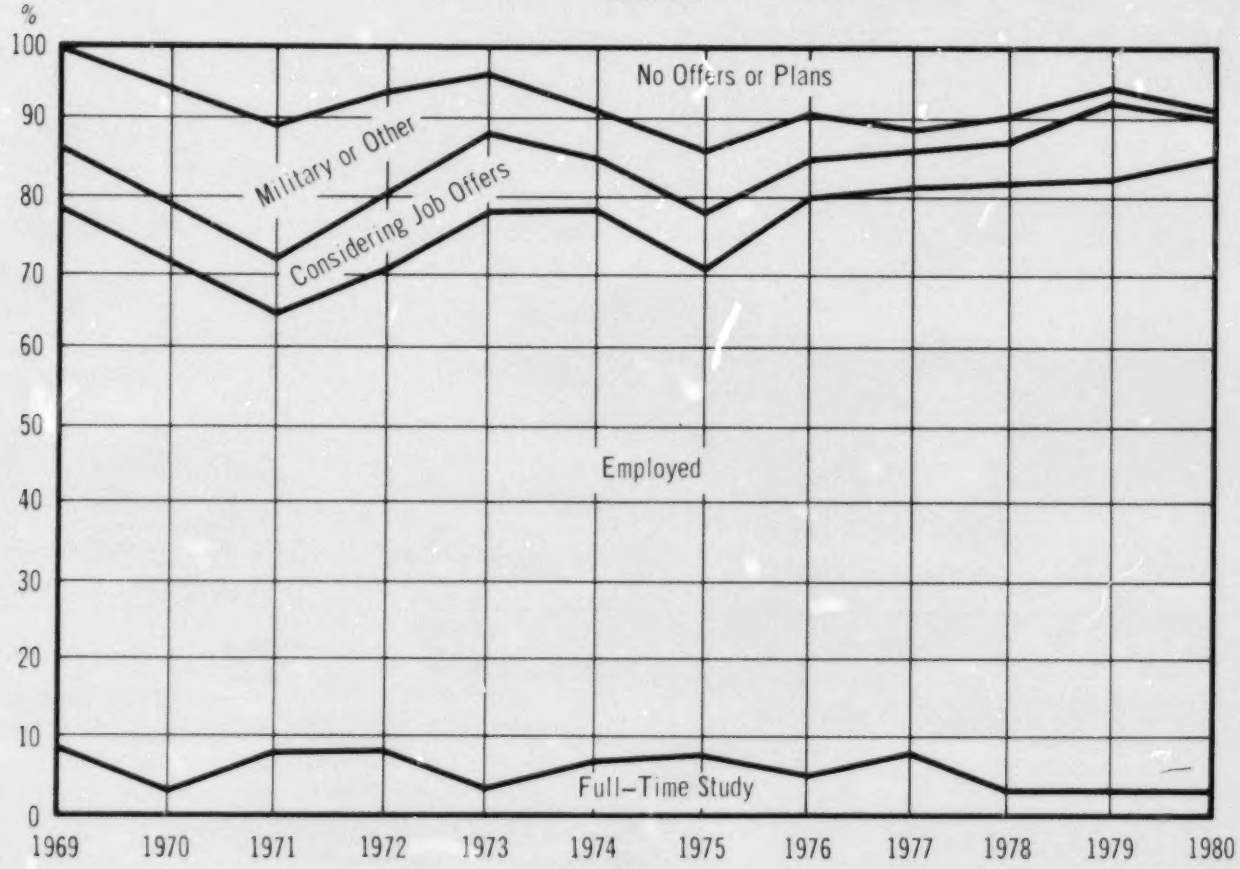


FIGURE 5

TABLE 7

PLACEMENT STATUS OF BACHELOR'S DEGREE TECHNOLOGY GRADUATES 1980 COMPARED WITH PREVIOUS YEARS

Placement Status	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Employed	72%	69%	60%	67%	76%	75%	66%	74%	77%	82%	80%	82%
Full-Time Study	7	4	5	5	3	4	4	6	6	2	3	3
Military Service**	12	9	13	7	5	3	4	2	**	*	**	**
Other Specific Plans	*	2	4	2	4	3	4	4	2	2	2	1
Considering Job Offers	8	11	8	12	8	5	7	5	5	4	9	5
No Offers or Plans	*	5	11	7	4	11	16	10	11	10	7	9
Total With Status Known	100	100	100	100	100	100	100	100	100	100	100	100

* Less than 1%

** Combined with Other Specific Plans starting in 1977

NOTE: Percentages may not add to totals because of rounding.

TABLE 8

PLACEMENT STATUS OF BACHELOR'S DEGREE TECHNOLOGY GRADUATES BY CURRICULUM—1980

Placement Status	Aero	Arch	Civil	Comput	Draft	Elec
Accepted Job Offer	50%	46%	76%	87%	75%	77%
Employed, Returning to Job	29	7	4	2	6	8
Full-Time Study	14	10	4	0	0	1
Other Specific Plans	0	2	1	0	0	1
Considering Job Offers	7	3	4	0	6	6
No Offers, Seeking Work	0	32	11	10	12	7
Total With Status Known	100	100	100	100	100	100
Number With Status Known	14	162	304	86	80	578

Placement Status	Elex	Indus	Mfg	Mech	Other	Total
Accepted Job Offer	80%	68%	72%	73%	72%	73%
Employed, Returning to Job	6	19	12	5	13	9
Full-Time Study	2	2	4	2	3	3
Other Specific Plans	2	1	1	1	1	1
Considering Job Offers	3	3	4	10	4	5
No Offers, Seeking Work	8	6	7	9	8	9
Total With Status Known	100	100	100	100	100	100
Number With Status Known	468	729	141	581	1145	38

NOTE: Percentages may not add to 100% because of rounding.

TABLE 9

PLACEMENT STATUS OF BACHELOR'S DEGREE TECHNOLOGY GRADUATES–1980
ABET ACCREDITED AND NON-ACCREDITED SCHOOLS

Placement Status	All Schools No.	%	ABET Schools No.	%	Non-ABET Schools No.	%
Accepted Job Offer	2832	73	2020	74	812	71
Employed, Returning to Job	344	9	218	8	126	11
Full-Time Study	116	3	82	3	34	3
Other Specific Plans	183	5	137	5	46	4
Considering Job Offers	38	1	27	1	11	1
No Offers, Seeking Work	360	9	246	9	114	10
Total With Status Known	3873	100	2730	100	1143	100
No Information	1153	---	764	---	389	---
Total Reported	5026	---	3494	---	1532	---

NOTE: Percentages may not add to totals because of rounding. ABET schools are those having at least one curriculum in engineering technology accredited by ABET. However, some curricula may not be accredited.

TABLE 10

MONTHLY STARTING SALARIES OF 1980 TECHNOLOGY GRADUATES
BACHELOR'S DEGREE LEVEL

Curriculum	No. of Schools	No. of Salaries	Avg Low*	Mean Non-ABET Schools**	Overall Mean	Mean ABET Schools**	Avg High***
Aerospace	2	8	$1315	$1666	$1540	$1413	$1750
Air Conditioning	1	23	1250	NA	1589	1589	1700
Architectural	3	27	933	1666	1271	1256	1447
Automotive Eng. Tech.	3	23	1172	1673	1323	1249	1396
Civil	20	161	1255	1691	1408	1366	1644
Chem. Eng. Tech.	1	14	1500	1130	730	****	2016
Computer	8	82	1302	1510	1510	1511	1679
Drafting & Design Tech.	5	58	1174	1309	1488	1590	1579
Electrical	30	486	1340	1476	1618	1638	1784
Electronic	21	345	1289	1500	1525	1541	1762
Industrial	16	406	1170	1547	1511	1562	1746
Manufacturing	12	73	1473	1595	1575	1567	1744
Mechanical	37	413	1368	1508	1601	1627	1787
Nuclear Tech.	2	27	1467	1621	1513	1488	1718
Other	26	317	1287	1194	1361	1517	1718
Total	187	2463	1298	1435	1505	1544	1728

* Mean of the lowest figures reported by responding schools.

** ABET schools are those having at least one engineering technology curriculum accredited by ABET. Specific curricula for these schools may or may not be accredited. There were 119 ABET schools and 68 others in the total of 187 included in this table.

*** Mean of the highest figures reported by responding schools.

**** Insufficient data.

further study and returning to jobs. The lowest proportion without job offers was in aerospace engineering. Architectural showed the greatest percentage without offers at 32 percent, increasing 7 points over 1979. Other fields were relatively close to the average. The individual curriculum statistics are based on rather small numbers with status known and should, therefore, be interpreted with caution. Graduation from schools having engineering technology curricula accredited by the Accreditation Board for Engineering and Technology (ABET) made some difference in the placement statistics. ABET schools had a higher job acceptance percentage and a lower "No Offers -- Seeking Work" percentage. Table 9 gives the breakdown on the basis of ABET school listing.

The EMC salary data reported in Table 10 indicate an overall average starting salary for bachelor of technology graduates this year was $1,505 per month, which was about $194 less than the average for engineers, but up by 8 percent over last year. This represents a premium of about 12.9 percent for the engineering degree, considerably more than the differential that prevailed up to 1974. (See Figure 3) As the number of technology graduates has increased to the point where they are no longer a novelty on the engineering scene, employers appear to be making more of a distinction between engineers and technologists, at least as far as salaries are concerned. It is probable that the differentiation also extends to the kind of position offered, but the EMC survey does not provide the information needed to examine this point.

MASTER DEGREE ENGINEERING GRADUATES

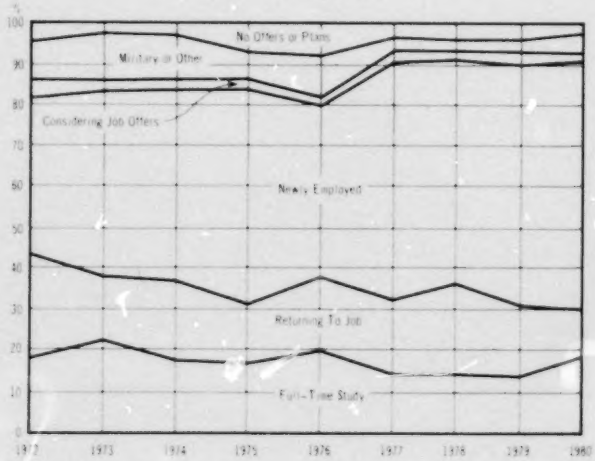
Placement at the master degree level is affected by the same economic influences as the other degree levels as shown in Figure 6. This year the proportion without job offers or other plans was one percent lower than last year, and the percentage employed decreased by two points to 73 percent. Table 11 gives the summarized results of all surveys since 1970. Eighteen percent of this year's graduates were continuing on toward the doctorate, 3 percent more than the last 3 years. While it is perhaps too early to say, this trend may be due to the increasing publicity about high-technology development and the need for replenishment of research-oriented faculty in colleges of engineering throughout the country.

The number returning to jobs was down a bit from last year, the percentage continuing to be low compared with the situation in 1970-72. However, this survey is not intended to cover students working for their degrees on a part-time basis or attending night school, since these engineers do not normally seek placement assistance. If such graduates were included, the percentage returning to jobs previously held would undoubtedly be higher than indicated here.

The breakdown by curriculum presented in Table 12 shows ceramic engineering and materials science and engineering in the weakest positions (based on the level of "No Offers").

Table 13 gives the starting salary offers for the different engineering curricula at the master level. The overall average was $1,890 per month, up 10.4 percent from 1979. Chemical

PLACEMENT STATUS OF MS ENGINEERING GRADUATES 1972-80



Source: Engineering Manpower Commission Placement Surveys.

FIGURE 6

TABLE 11

PLACEMENT STATUS OF MASTER'S DEGREE ENGINEERING GRADUATES—1980 COMPARED WITH PREVIOUS YEARS

Placement Status	1972	1973	1974	1975	1976	1977	1978	1979	1980
Newly Employed	38%	45%	49%	52%	42%	58%	56%	59%	61%
Returning to Job	25	17	18	13	17	18	21	16	12
Full-Time Study	19	22	18	18	20	15	15	15	18
Military Service*	7	7	4	2	2	*	*	*	*
Other Specific Plans	4	6	7	7	8	3	3	3	5
Considering Job Offers	3	2	1	1	2	1	2	4	2
No Offers or Plans	4	2	3	7	9	4	3	3	2
Total With Status Known	100	100	100	100	100	100	100	100	100

*Combined with Other Specific Plans starting in 1977.
NOTE: Percentages may not add to totals because of rounding.

TABLE 12

PLACEMENT STATUS OF ENGINEERING GRADUATES BY CURRICULUM, 1980
MASTER'S DEGREE PROGRAMS

Placement Status	Aero	Agr	Arch	Ceram	Chem	Civil	Comput	Elec	Eng Sci	Gen	Indust
Accepted Job Offer	41%	56%	63%	67%	70%	59%	55%	65%	18%	61%	63%
Employed, Returning to Job	14	4	4	11	5	19	16	10	2	6	21
Full-Time Study	33	32	22	*	14	14	17	17	80	10	10
Other Specific Plans	8	*	*	*	1	2	3	2	*	3	1
Considering Job Offers	4	8	11	*	6	5	8	5	*	19	3
No Offers, Seeking Work	*	*	*	22	3	2	1	1	*	*	3
Total With Status Known	100	100	100	100	100	100	100	100	100	100	100
Number With Status Known	49	25	27	9	308	466	147	552	61	31	156

Placement Status	Mat Sci & Eng	Mech	Metal	Mining & Geol	Nucl	Ocean	Petrol	Systems	Other	Total
Accepted Job Offer	56%	64%	59%	79%	54%	75%	50%	55%	54%	61%
Employed, Returning to Job	3	11	10	2	6	*	28	17	19	12
Full-Time Study	28	15	26	16	34	*	11	21	16	18
Other Specific Plans	*	3	*	2	*	*	6	6	1	2
Considering Job Offers	6	4	3	1	6	25	6	*	7	5
No Offers, Seeking Work	6	3	3	*	*	*	*	*	2	2
Total With Status Known	100	100	100	100	100	100	100	100	100	100
Number With Status Known	32	318	39	102	35	4	18	47	232	2658

NOTE: Percentages are based on number with status known and may not add to 100% because of rounding.

* is less than 1%

TABLE 13

STARTING SALARY OFFERS TO 1980 GRADUATES
MASTER'S DEGREE LEVEL

Curriculum	Average Dollars Per Month	Percent Increase Over 1979
Chemical Engineering	$1947	9.4
Civil Engineering	1753	9.9
Electrical Engineering	1912	10.5
Industrial Engineering	1861	10.9
Mechanical Engineering	1893	10.3
Metallurgy and Related	1891	10.7
All Engineering Fields	1889	10.0
Computer Science	1858	10.0
Business Administration, Mgt.*	1971	12.8

*After technical undergraduate degree

Source: Derived from the College Placement Council, Inc. Salary Survey Final Report, July, 1980.

engineers' salaries were noticeably higher than the average, while civil engineering graduates received the lowest offers. The highest average increases went to industrial engineering and metallurgy and related engineering graduates who received offers respectively up 10.9 and 10.7 percent from 1979. The average for MBA graduates with a technical undergraduate degree exceeded the top curriculum in engineering (chemical engineering) by about one percent.

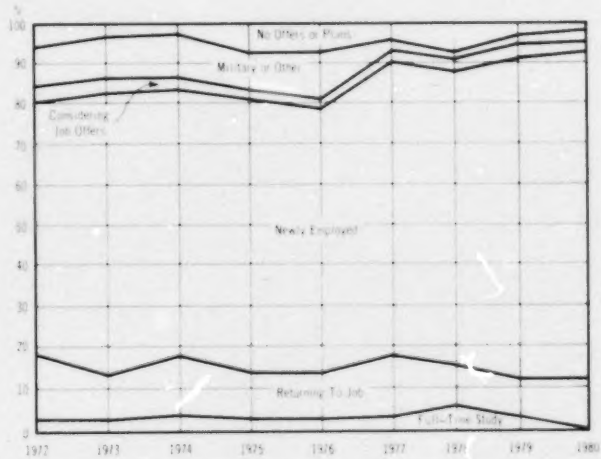
As pointed out earlier, most engineering graduates who continue immediately with graduate studies chose a technical program (see Figure 1). The fact that the difference in the average starting salaries paid to MS vs. MBA graduates is diminishing, indicates that employers may be placing less premium on the combination of engineering and business degrees.

DOCTOR DEGREE ENGINEERING GRADUATES

Ninety-two percent of engineering doctor degree recipients were employed as contrasted with 75 percent at the bachelor and 73 percent at the master degree levels. Table 14 shows how the placement situation for this group has varied over the years, and Figure 7 presents the same information in graphic form. Generally, doctoral graduates in engineering are new entrants into the job market, but this year twelve percent were returning to jobs previously held. In previous years, a larger proportion continued with post-doctorate study, and a smaller proportion returned to jobs previously held.

In the various specialties, as shown in Table 15, materials sci[illegible] had the highest percentage unplaced. Several fields showed unusually hig[illegible] or low percentages returning to jobs previously held. It should be noted, however, that the doctorate statistics are based on small numbers of graduates and the percentages shown should be viewed with caution. The placement experience of doctor degree engineering graduates from 1970 to date provides no cause for alarm, despite the poor prospects envisioned for other doctorate fields. The employment patterns of doctor degree engineers bear little resemblance to those in the social sciences or humanities. National statistics indicate that fully half of all PhD engineers are employed in in-

PLACEMENT STATUS OF PhD ENGINEERING GRADUATES 1972-80



Source: Engineering Manpower Commission Placement Surveys.

FIGURE 7

TABLE 14

PLACEMENT STATUS OF DOCTOR'S ENGINEERING GRADUATES—1980 COMPARED WITH PREVIOUS YEARS

Placement Status	1972	1973	1974	1975	1976	1977	1978	1979	1980
Newly Employed	64%	69%	66%	69%	65%	75%	73%	79%	80%
Returning to Job	14	11	15	12	11	13	8	9	12
Full-Time Study	2	2	3	2	3	3	6	3	0
Military Service*	2	3	1	2	2	*	*	*	*
Other Specific Plans	9	11	10	6	10	3	1	3	3
Considering Job Offers	3	3	2	1	1	1	2	3	3
No Offers or Plans	5	2	2	8	8	4	10	3	2
Total With Status Known	100	100	100	100	100	100	100	100	100

*Combined with Other Specific Plans starting in 1977.
NOTE: Percentages may not add to totals because of rounding.

dustry, while in most other fields academic employment is predominant. Only a relative handful go into post-doctoral study, an activity which is viewed by many other fields as a "holding pattern" to support highly qualified graduates until permanent employment can be found.

Salary offers to engineering doctorates are listed in Table 16. Salaries in all of these fields show substantial improvement over the 1979 figures, except for civil engineering. The average of civil engineering salaries declined by 7.6 percent compared to last year. Electrical engineering led all other fields with an average annual salary offer of $30,408 at the doctoral degree level. The most dramatic increase during the past year, amounting to 18.5 percent, occurred in the case of metallurgical engineering.

TABLE 16

STARTING SALARY OFFERS TO 1980 GRADUATES DOCTOR'S DEGREE LEVEL

Curriculum	Average Dollars Per Month	Percent Increase Over 1979
Chemical Engineering	$2452	9.9
Civil Engineering	2089	-7.6
Electrical Engineering	2534	14.1
Mechanical Engineering	2426	12.3
Metallurgy and Related	2419	18.5
All Engineering Fields	2466	12.2

Source: Derived from the College Placement Council, Inc. Salary Survey Final Report, July, 1980

TABLE 15

PLACEMENT STATUS OF ENGINEERING GRADUATES BY CURRICULUM—1980 DOCTOR'S DEGREE PROGRAM

Placement Status	Aero	Agr	Chem	Civil	Comput	Elec	Eng Sci	Gen	Indust
Accepted Job Offer	92%	100%	89%	73%	74%	80%	65%	89%	94%
Employed, Returning to Job	8	0	8	12	24	11	6	0	0
Full-Time Study	0	0	0	1	0	0	0	0	0
Other Specific Plans	0	0	0	5	3	1	23	0	6
Considering Job Offers	0	0	1	4	0	5	4	11	0
No Offers, Seeking Work	0	0	2	0	0	3	2	0	0
Total With Status Known	100	100	100	100	100	100	100	100	100
Number With Status Known	13	12	91	78	34	107	52	9	16

Placement Status	Mat*	Mech	Metal	Mining	Nucl	Other	Petrol	Systems	Total
Accepted Job Offer	85%	68%	95%	94%	75%	84%	75%	94%	80%
Employed, Returning to Job	0	28	5	6	19	11	25	0	12
Full-Time Study	0	0	0	0	6	0	0	0	0
Other Specific Plans	7	1	0	0	0	0	0	0	3
Considering Job Offers	0	3	0	0	0	3	0	0	2
No Offers, Seeking Work	7	0	0	0	0	3	0	6	2
Total With Status Known	100	100	100	100	100	100	100	100	100
Number With Status Known	32	68	19	18	16	76	4	16	661

NOTE: Percentages may not add to 100% because of rounding.
*Including ceramic

The picture this year shows a few changes from 1979 as shown in Figure 8 and Table 17. The proportion going on to full-time study decreased one percentage point, while the percentage employed fell by two points. The number without job offers or other plans remained the same, at seven percent.

PLACEMENT STATUS OF ASSOCIATE DEGREE TECHNOLOGY GRADUATES 1969-80

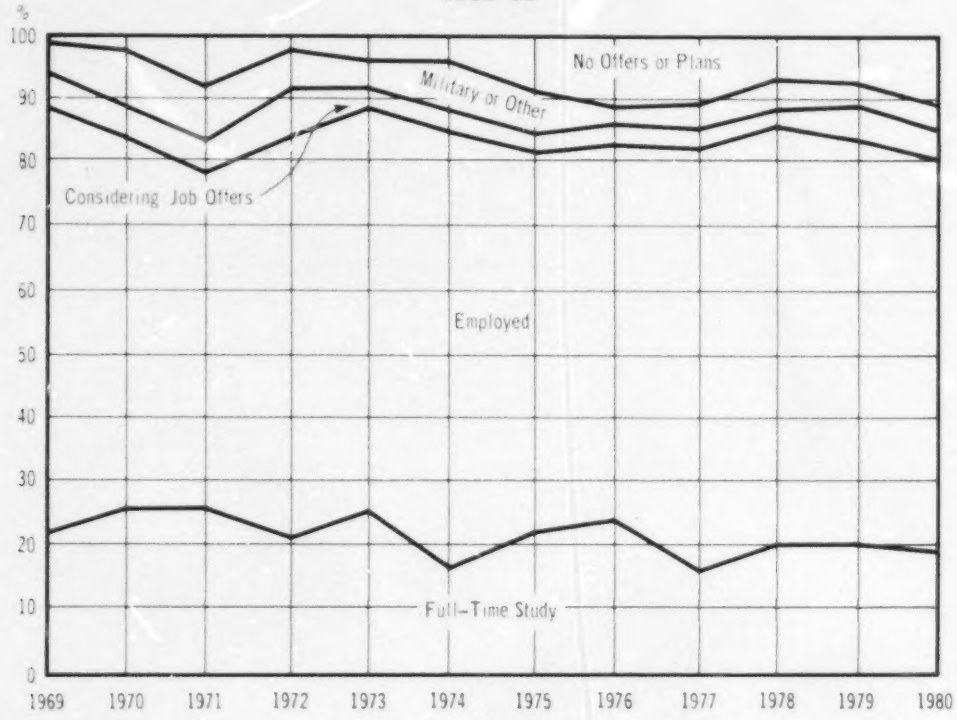


FIGURE 8

TABLE 17

PLACEMENT STATUS OF ASSOCIATE DEGREE TECHNOLOGY GRADUATES 1980 COMPARED WITH PREVIOUS YEARS

Placement Status	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Employed	63%	56%	47%	58%	61%	67%	59%	58%	64%	65%	63%	61%
Full-Time Study	23	28	29	24	25	18	23	24	17	20	20	19
Military Service**	6	7	8	3	1	2	1	*	**	**	**	**
Other Specific Plans	1	*	1	2	1	*	1	1	5	5	4	4
Considering Job Offers	6	5	8	9	7	6	4	6	4	3	6	5
No Offers or Plans	*	4	7	4	5	6	11	10	10	7	7	10
Total With Status Known	100	100	100	100	100	100	100	100	100	100	100	100

*Less than 1%
** Combined with Other Specific Plans starting in 1977
NOTE: Percentages may not add to totals because of rounding.

TABLE 18

PLACEMENT STATUS OF ASSOCIATE DEGREE TECHNOLOGY GRADUATES, 1980
ABET ACCREDITED AND NON-ACCREDITED SCHOOLS

Placement Status	All Schools No.	%	ABET Schools No.	%	Non-ABET Schools No.	%
Accepted Job Offers	3303	55	1936	49	1367	68
Employed, Returning to Job	398	7	277	7	121	6
Full-Time Study	1149	19	988	25	161	8
Other Specific Plans	299	5	158	4	141	7
Considering Job Offers	218	4	158	4	60	3
No Offers, Seeking Work	596	10	435	11	161	8
Total with Status Known	5963	100	3952	100	2011	100
No Information	853	---	632	---	221	---
Total Reported	6816	---	4584	---	2232	---

NOTE: Percentages may not add to totals because of rounding. ABET schools are those having at least one curriculum in engineering technology accredited by ABET. However, some curricula may not be accredited.

TABLE 19

PLACEMENT STATUS OF TECHNOLOGY GRADUATES BY CURRICULUM, 1980
ASSOCIATE DEGREE PROGRAMS, ALL SCHOOLS

Placement Status	Aero	Air Cond	Arch	Auto	Chem	Civil	Com-puter	Draft-ing
Accepted Job Offer	49%	67%	44%	56%	48%	45%	53%	62%
Employed, Returning to Job	5	3	6	6	6	5	1	4
Full-Time Study	34	7	32	19	19	26	22	19
Other Specific Plans	*	4	3	3	2	4	4	1
Considering Job Offers	*	7	4	4	4	7	4	7
No Offers, Seeking Work	12	12	10	12	22	13	16	8
Total With Status Known	100	100	100	100	100	100	100	100
Number With Status Known	41	168	482	301	101	503	475	502

Placement Status	Elec-trical	Elec-tronic	Indust Tech	Mfg	Mech	Nucl	Other	Total
Accepted Job Offer	62%	65%	56%	45%	53%	66%	46%	55%
Employed, Returning to Job	3	6	6	21	6	3	16	6
Full-Time Study	18	11	27	10	27	18	14	19
Other Specific Plans	2	8	4	8	1	*	6	4
Considering Job Offers	3	4	1	11	4	3	7	5
No Offers, Seeking Work	10	6	6	7	9	11	10	10
Total With Status Known	100	100	100	100	100	100	100	100
Number With Status Known	601	1247	70	92	712	38	613	5946

NOTE: Percentages may not add to 100% because of rounding.
* is less than 1%

Table 18 gives the overall breakdown between schools having at least one engineering technology curriculum accredited by the Accreditation Board for Engineering and Technology and schools not in this category. Both kinds of schools are well represented in the total statistics. ABET schools had 49 percent newly employed, but were still about 19 percentage points below the non-ABET schools. The proportion of graduates from ABET schools continuing full-time study increased from 24 percent in 1979 to 25 percent in 1980, while the same category in the non-ABET schools lost three percentage points to 8 percent this year.

Table 19 gives the breakdown by curriculum for all technology schools combined. Here it is seen that advanced study is favored heavily by certain curricula, most notably architectural, civil, computer, industrial and mechanical technology. Civil, computer, and chemical had the largest percentages of unplaced graduates; manufacturing, industrial, and electronics technology had the smallest. In the employed category, manufacturing technology showed the largest proportion of graduates returning to jobs previously held.

Because of the significant differences in statistics between the ABET and non-ABET schools, Tables 20 and 21 give a further breakdown by curriculum for each set. There is considerable variability within a given curriculum

TABLE 20

PLACEMENT STATUS OF TECHNOLOGY GRADUATES BY CURRICULUM—1980
ASSOCIATE DEGREE PROGRAMS, ABET SCHOOLS

Placement Status	Aero	Air Cond	Arch	Auto	Chem Eng Tech	Civil	Com-puter	Draft-ing
Accepted Job Offer	49%	43%	33%	41%	44%	41%	52%	58%
Employed, Returning to Job	5	1	6	9	7	6	1	3
Full-Time Study	34	11	39	30	21	32	26	26
Other Specific Plans	*	6	3	2	1	3	4	*
Considering Job Offers	*	13	4	2	3	4	1	6
No Offers, Seeking Work	12	26	14	16	24	14	17	7
Total With Status Known	100	100	100	100	100	100	100	100
Number With Status Known	41	70	302	128	89	383	328	300

Placement Status	Elec-trical	Elec-tronic	Indust Tech	Mfg	Mech	Nucl	Other	Total
Accepted Job Offer	59%	55%	56%	36%	49%	69%	45%	49%
Employed, Returning to Job	4	7	6	29	6	*	17	7
Full-Time Study	21	17	27	17	35	19	15	25
Other Specific Plans	2	10	4	7	2	*	6	4
Considering Job Offers	2	5	1	*	1	*	8	4
No Offers, Seeking Work	12	5	6	12	7	11	10	11
Total With Status Known	100	100	100	100	100	100	100	100
Number With Status Known	459	671	70	42	503	36	529	3951

NOTE: Percentages may not add to 100% because of rounding. ABET schools are those having at least one curriculum in engineering technology accredited by ABET. However, some curricula may not be accredited.

* less than 1%

depending on accreditation status of the schools. Neither group seems to enjoy a consistent advantage in placement results. However, a larger proportion of graduates from ABET schools continue school. Some of the difference may be due to the small size of the population in some groups, but much of the variability appears to result from conditions at individual schools responding to the survey. The job market for technicians tends to be affected strongly by local as well as national factors, and this is reflected in the placement results each year.

Starting salary statistics for associate degree graduates are given in Table 22. Similar to last year, ABET school graduates have an overall edge in average salaries received, but this does not apply in all disciplines, and non-ABET schools have higher mean salaries for architectural, chemical, computer, industrial, and manufacturing technology. The average differences between sets of schools and among curricula are not very consistent from year to year, probably because of the small samples.

The columns headed "Avg. Low" and "Avg. High" simply give the arithmetic mean of the lows and highs reported by each school, regardless of the number of salaries covered. Overall statistics such as these should be interpreted with due regard to local conditions and experience in view of the wide divergence among schools providing data for the EMC survey.

TABLE 21

PLACEMENT STATUS OF TECHNOLOGY GRADUATES BY CURRICULUM—1980
ASSOCIATE DEGREE PROGRAMS, NON-ABET SCHOOLS

Placement Status	Aero	Air Cond	Arch	Auto	Chem Eng Tech	Civil	Com-puter	Draft-ing
Accepted Job Offer	80%	71%	43%	100%	64%	0%	100%	68%
Employed, Returning to Job	20	18	0	0	2	0	0	11
Full-Time Study	0	6	5	0	4	0	0	0
Other Specific Plans	0	6	0	0	0	0	0	13
Considering Job Offers	0	0	2	0	0	0	0	0
No Offers, Seeking Work	0	0	50	0	30	0	0	8
Total With Status Known	100	100	100	100	100	100	100	100
Number With Status Known	5	17	56	7	50	0	17	38

Placement Status	Elec-trical	Elec-tronic	Indust Tech	Mfg	Mech	Nucl Tech	Other	Total
Accepted Job Offer	62%	81%	72%	63%	71%	100%	76%	71%
Employed, Returning to Job	20%	7	13	24	16	0	5	11
Full-Time Study	2	0	2	2	1	0	5	3
Other Specific Plans	8	5	2	6	7	0	3	4
Considering Job Offers	0	2	2	0	0	0	1	1
No Offers, Seeking Work	7	5	9	5	6	0	10	10
Total With Status Known	100	100	100	100	100	100	100	100
Number With Status Known	71	130	296	63	139	12	242	1143

NOTE: Percentages may not add to 100% because of rounding. Non-ABET schools are those having no engineering technology curricula accredited by ABET.

TABLE 22

MONTHLY STARTING SALARIES OF 1980 TECHNOLOGY GRADUATES
ASSOCIATE DEGREE LEVEL

Curriculum	No. of Schools	No. of Salaries	Avg Low[1]	Mean Non-ABET Schools	Overall Mean	Mean ABET Schools	Avg High**
Aero. Eng. Tech.*	1	7	$1104	$***	$1264	$1264	$1586
Air Conditioning	7	109	821	1091	1103	1137	1411
Architectural	16	149	757	922	919	912	1076
Automotive	13	178	644	925	988	1052	1218
Chemical	11	85	1034	1263	1173	1141	1234
Civil	30	206	877	1082	1098	1108	1274
Computer	18	165	934	1078	1116	1033	1389
Drafting	23	233	914	965	1011	1083	1135
Electrical	27	379	953	1062	1183	1234	1515
Electronic	39	880	950	1120	1120	1120	1428
Industrial*	7	46	1140	1305	1226	1188	1440
Manufacturing*	7	57	812	995	949	921	1113
Mechanical	32	1307	969	1164	1175	1188	1366
Nuclear*	1	8	866	***	1377	1377	1250
Other	19	139	908	1092	1108	1131	1263
Total	251	2948	910	1079	1105	1136	1318

[1] Mean of the lowest figures reported by responding schools.
* Data may not be representative due to the small number of responses.
** Mean of the highest figures reported by responding schools.
*** Insufficient data.

PLACEMENT STATUS OF WOMEN AND MINORITY ENGINEERING AND TECHNOLOGY GRADUATES

For the fourth year, the Engineering Manpower Commission asked for placement data on minority members and women in the graduating classes. The results were encouraging in that usable information was reported on 2,194 graduates from the five special groups in question. The placement data for each of the five degree levels reported -- bachelor, master, and doctor in engineering; associate and bachelor in technology -- are included in the Appendix tables. In view of the lack of prior data for comparison and the small numbers involved in most of the categories, it would be premature to attempt to draw definitive conclusions from these data. Table 23 gives the placement statistics for the bachelor degree graduates in engineering only, since this group had the largest number of students reported.

As a general conclusion, the survey results support the impression generally held among engineering educators and employers that women and minority members are in strong demand. On the other hand, the data do not indicate extreme favoritism toward these groups, since the proportions without job offers or other plans are reasonably close to the average for all engineering and technology graduates except for Blacks and American Indians, who this year appear to have a much lower than average rate. Persons closely associated with programs aimed at increasing the representation of women and minorities in engineering have frequently pointed out that each of these groups must be considered individually because of its distinctive characteristics and special needs. The placement data is summarized below for each of the groups.

Women. Female graduates generally showed slightly lower percentages unplaced (i.e., without job offers or other plans) than their degree groups as a whole. Compared with all engineering graduates at the bachelor level in engineering, higher percentages were in the employed categories (either having accepted a job or returning to one previously held). These findings are consistent with the higher salaries and the relatively small number of women engineering graduates.

Blacks. Table 23 shows that Blacks at the bachelor level had a higher than average percentage of employment; also, a significantly larger than average

TABLE 23

PLACEMENT STATUS OF WOMEN AND MINORITY GRADUATES, 1980 BACHELOR'S DEGREE IN ENGINEERING

Placement Status	Women	Blacks	Hispanics	Asians	Amer. Indians	All Graduates
Accepted Job Offer	77%	80%	80%	64%	76%	73%
Employed, Returning to Job	2	5	5	1	0	2
Full-Time Study	10	8	5	20	24	12
Other Specific Plans	2	1	1	4	0	2
Considering Job Offers	6	5	7	6	0	5
No Offers, Seeking Work	3	1	3	4	0	5
Total With Status Known	100	100	100	100	100	100
Number With Status Known	1493	284	186	210	21	23970

percentage of Blacks are returning to jobs previously held. In contrast, a smaller number are continuing full-time study.

Hispanics. Bachelor degree graduates from this minority group had a higher than average percentage employed. The percentage going on to full-time study was about one-half of the average at the BS level. It should be noted that the Hispanic group is made up of various ethnic elements having different backgrounds and different geographical concentrations. The statistics are based on such small numbers of graduates that they should not be taken as indicative of any consistent trend.

Asians. The most outstanding feature of this group is the high proportion of engineering graduates going on to further full-time study; the percentage increased from 12 last year to 20 this year. This finding is consistent with past degree and enrollment statistics for Asian Americans. Few Asians were reported from the technology schools in either associate or bachelor degree programs.

American Indians. The number of graduates from this minority were too small to provide useful statistics except possibly at the bachelor level. Virtually all graduates were either newly employed or going on to full-time graduate study, but with only 21 bachelor degrees reported, no conclusions should be drawn.

Deaf. Although not a defined minority group, technology graduates in this handicapped category were reported specially by the National Technical Institute for the Deaf at Rochester Institute of Technology. Of 20 graduates at the bachelor and associate levels, 45 percent were employed and 25 percent were continuing their education.

ENROLLMENT AND DEGREE TRENDS

The number of bachelor degree graduates peaked in 1972, then dropped in 1975 because of the sharp decline in freshmen enrollments after 1970. Although the 1973 freshmen class was the smallest in over 20 years, students transferring into engineering programs at the sophomore or junior year have tended to make up for some of the loss, and the number of degrees earned began to rise in 1976 as expected. Figures 9 and 10 and Table 24 show how enrollment and degree totals have varied over the years. The Engineering Manpower Commission has concluded that it is impossible to make accurate projections of future degrees because of the many imponderable factors involved. Such projections are made annually by the National Center for Education Statistics, U.S. Department of Education, Washington, D.C. 20202 and published by the Government Printing Office in the Projections of Education Statistics series of reports.

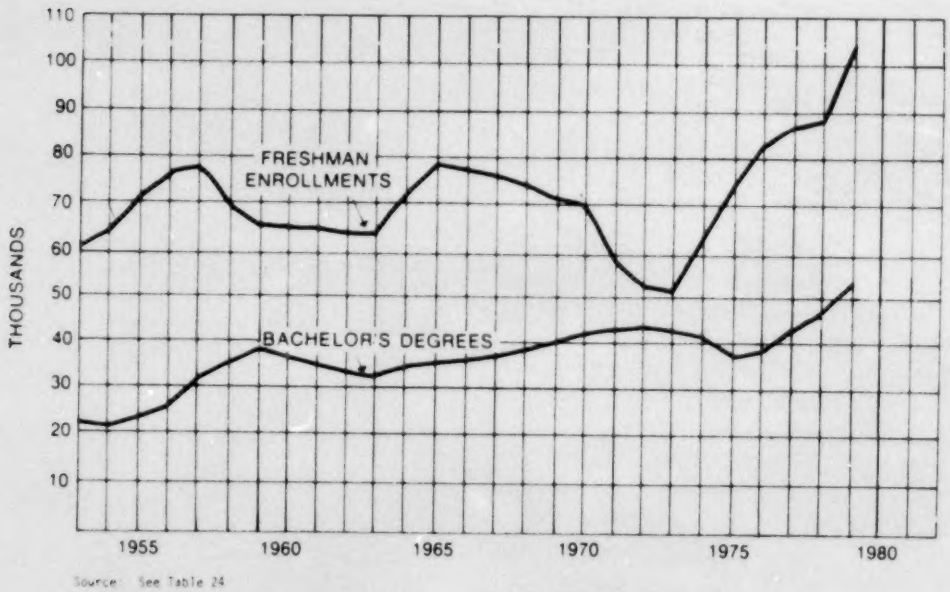
Technology degree trends are more difficult to assess than those in engineering because data are incomplete, programs have changed markedly in recent years and are still continuing to be developed, and the number of schools offering technology programs has increased very rapidly over the past decade.

Bachelor of technology degrees as reported to EMC are shown in Table 25. For the first time in over 10 years, the number of schools offering bachelor of technology degrees reporting in the 1979 EMC survey was reduced by 9.5 percent compared to 1978 and the number of graduates reported was reduced by 7 percent. During this same period, reported first degrees in engineering increased by 14 percent (see Table 23).

Table 26 summarizes the data obtained from the EMC surveys of two-year technology graduates since 1968 and indicates the difficulty caused by the variety of programs involved. The conclusion drawn from a detailed comparison of matched sets of schools is that enrollments in two-year programs are not growing as rapidly as might appear to be the case. Paradoxically, the number of freshmen enrollments decreased slightly from 1970 to 1971 and from 1972 to 1973. This is not indicated by the data. Many two-year graduates transfer to bachelor degree programs and are ultimately accounted for in those statistics.

Users of these enrollment and degree tables will note the wide swings which have occurred in the past as students have been attracted to or away from engineering as a course of study. Anyone attempting to forecast the future should particularly note the rapid changes in freshmen enrollments since 1970 and the difficulty of projecting future degrees on the basis of enrollment data alone.

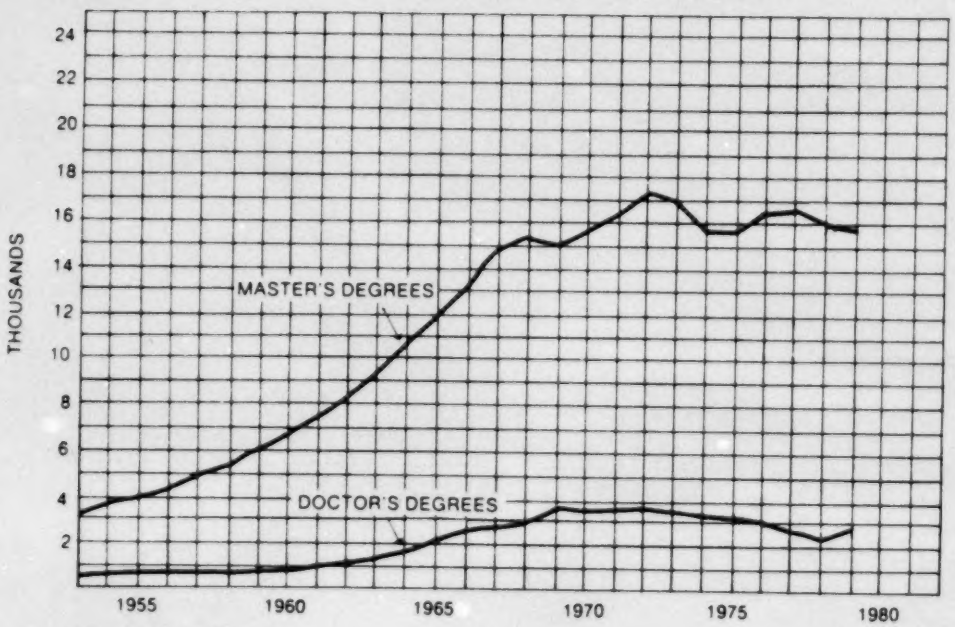
FRESHMAN ENROLLMENTS AND BACHELOR'S DEGREES IN ENGINEERING



Source: See Table 24

FIGURE 9

ENGINEERING MASTER'S AND DOCTOR'S DEGREES



Source: See Table 24

FIGURE 10

TABLE 24

ENGINEERING ENROLLMENTS AND DEGREES

YEAR	FRESHMAN ENROLLMENTS (FALL)	FIRST DEGREES	MASTER		DOCTOR	
			ENROLLMENTS (FALL)	DEGREES	ENROLLMENTS (FALL)	DEGREES
1953	60478	24164	18323	3635	3001	592
1954	65505	22236	17205	4078	3283	590
1955	72825	22589	18482	4379	3163	599
1956	77738	26306	22274	4589	3402	610
1957	78757	31221	23840	5093	4180	596
1958	70029	35332	27833	5669	4763	647
1959	67704	38134	29355	6615	5643	714
1960	67556	37808	30817	6989	6445	786
1961	67575	35860	32054	7977	7869	943
1962	64707	34735	35359	8909	9240	1207
1963	65740	33458	37781	9460	10827	1378
1964	73682	35226	42159	10827	12622	1693
1965	79872	36691	44208	12246	13947	2124
1966	78400*	35815	-----	13677	-----	2303
1967	77551	36186	34231	13887	15376	2614
1968	77484	38002	24469	15152	15768	2933
1969	74113	39972	20014	14980	14298	3345
1970	71661	42966	23216	15548	14802	3620
1971	58566	43167	22405	16383	14100	3640
1972	52100	44190	22877	17356	13460	3774
1973	51925	43429	22588	17152	11904	3587
1974	63444	41407	21999	15885	10628	3362
1975	75343	38210	26004	15773	11281	3138
1976	82250	37970	25516	16506	10963	2977
1977	88780	40095	26876	16551	12359	2814
1978	95805	46091	26060	16182	12321	2573
1979	103724	52598	27923	15624	13461	2815

NOTES:
All data from 1953 through 1966 are from U.S. Office of Education except as noted. Enrollment for master's and doctor's degrees for these years include both full-time and part-time students. Data from 1967 through 1979 are from EMC annual surveys. All enrollments for these years are full-time only. Enrollments are for fall of the year indicated. Degrees are for the school-year ending in June of the year indicated.

*Estimate by EMC

TABLE 25

BACHELOR OF TECHNOLOGY DEGREES

Year Ending in June	BSET	BSIT	Total BT	No. of Schools
1968	842	943	1785	46
1969	1911	947	2858	65
1970	2570	1535	4105	62
1971	3194	1810	5004	87
1972	4244	1243	5487	80
1973	4402	2076	6478	96
1974	4830	1613	6443	93
1975	5867	2042	7909	114
1976	5721	1358	7079	122
1977	6337	1345	7682	146
1978	7164	2202	9366	168
1979	6604	2105	8714	152

NOTES:
Definitions and survey coverage have varied from year to year, therefore the data in this table cannot be relied upon to indicate definitive trends. Because of incomplete responses, the total figures for each year do not represent actual U.S. totals for the programs covered. Column headings are as follows: BSET--Bachelor of Engineering Technology, BSIT--Bachelor of Industrial Technology. The number of schools responding to each year's EMC survey is given as an indication of coverage.

TABLE 26

TWO-YEAR TECHNOLOGY DEGREES

Year Ending in June	Cert.	ASET	ASIT	Pre Eng.	Total 2-Yr.	No. of Schools
1966*	----	12244	9915	2923	25082	504
1967*	----	16445	13752	----	30197	517 (est.)
1968**	----	16920	1560	----	18480	369
1969***	----	18808		2383	21191	394
1970****	4136	17134		2731	24001	384
1971****	6113	18994		3374	28481	493
1972****	6768	20408		2098	29346	430
1973	5004	16563	6481	1753	29801	475
1974	431	15832	7389	1705	25357	443
1975	----	16004	5792	998	22794	285
1976	2042	15591	6090	1369	25092	326
1977	1860	15123	5346	858	23187	361
1978	2245	16099	6660	1616	26620	479
1979	1161	14622	5306	1104	22193	344

NOTES:
Definitions and survey coverage have varied from year to year, therefore the data in this table cannot be relied upon to indicate definitive trends. Because of incomplete responses, the total figures for each year do no represent actual U.S. totals for the various kinds of programs covered. Column headings are are follows: CERT -- Certificate, ASET -- Associate in Engineering Technology, ASIT -- Associate in Industrial Technology, PreEng. -- Pre-Engineering transfer programs. The number of schools responding to each year's EMC survey is given as an indication of coverage.

*Graduates for these years were estimated by the schools prior to graduation. Industrial technology figures are for "skill oriented occupational curricula of at least one year," whereas engineering technology are for 2-3 year programs only.

**Both ET and IT figures this year were for "associate degree or equivalent."

***No attempt was made this year to distinguish ET from IT degrees within the same technical field, or to distinguish certificates from associate degrees.

****No attempt was made these years to distinguish ET from IT degrees within the same technical field.

ENTREPRENEURSHIP AND INNOVATION

As an additional feature of this year's survey, questions were asked relating to the current concerns about U.S. productivity and innovation. The results of this survey are shown on a copy of the questionnaire in the Appendix. Of the 212 schools reporting, 9 percent stated that they were currently offering coursework in innovation and entrepreneurship. Another 7 percent of the schools indicated that such instruction was either currently offered as a part of on-going courses in other areas or that they were now planning to offer such courses.

There is, as yet, no evidence to demonstrate the impact of such course work on the generation of new products and services. However, further studies in this area are planned by EMC because of the growing national concern that the U.S. needs a revitalization in technological enterprise.

APPENDIX

PARTICIPANTS IN THE 1980 PLACEMENT SURVEY
ALPHABETICAL BY STATE

Engineering Schools

Auburn University
University of Alabama
University of Alaska
Arkansas State University
John Brown University
California Institute of Technology
*California State Polytechnical University
California State University - Chico
California State University - Fresno
California State University - Northridge
Harvey Mudd College
*Loyola Marymount University
University of California - Davis
University of California - Irvine
University of California - Santa Barbara
University of the Pacific
*University of Redlands
Colorado School of Mines
*Colorado State University
University of Colorado
Trinity College
University of Connecticut
University of Hartford
University of Delaware
University of District of Columbia
Howard University
*Embry - Riddle Aero University
University of Central Florida
Florida Atlantic University
University of Florida
University of Miami
University of Southern Florida
Georgia Institute of Technology
University of Georgia
University of Hawaii
*Idaho State University
University of Idaho
Bradley University
Millikin University
Northwestern University
*Southern Illinois University - Carbondale
*Southern Illinois University - Edwardsville
Indiana Institute of Technology
Purdue University - West Lafayette
Purdue University - Indianapolis
Rose - Hulman Institute of Technology
University of Evansville
Valparaiso University
Iowa State University
Kansas State University
University of Kansas
Wichita State University
University of Kentucky
University of Louisville
*Louisiana State University
Louisiana Technical University
McNeese State University
Southern University
Tulane University
University of Southwestern Louisiana
*Loyola College
Northeastern University
*Harvard University
Southeastern Massachusetts University
University of Massachusetts - Amherst
Western New England College
Worcester Polytechnical Institute
Lawrence Institute of Technology
*Michigan State University
Michigan Technical University
University of Detroit
University of Michigan - College of Engineering
University of Michigan
Wayne State University
*University of Minnesota
University of Mississippi
University of Missouri- Columbia
University of Missouri - Rolla
Washington University
Montana College of Numeral Science and Technology
University of Nebraska
University of Nevada
*University of Nevada - Reno
Dartmouth College
New England College
New Jersey Institute of Technology
Rutgers University
Stevens Institute
New Mexico State University
Clarkson College
Cooper Union
Cornell University
*Hofstra University
Polytechnic Institute of New York
Rensselaer Poly Institute
Rochester Institute of Technology
SUNY College of Ceramics at Alfred
*Syracuse University
Union College
University of Rochester
Webb Institute of Naval Architecture
Duke University
North Carolina A & T
North Carolina State University
University of North Dakota
Case Western Reserve
Marietta College
Ohio Northern University
Ohio State University
University of Toledo
Wright State University
Youngstown State University
*Oklahoma State University
University of Oklahoma
University of Tulsa
Portland State University
*University of Portland
Bucknell University
Carnegie Mellon University
Drexell University
Gannon College
*Geneva College
Grove City College
Lafayette College
Lehigh University
Pennsylvania State University
Philadelphia College of Tex'iles & Science
Swarthmore College
University of Pittsburgh
Villanova University
Widener University
Wilkes College
*Brown University
Clemson University
University of Rhode Island
University of South Carolina
South Dakota School of Mines & Technology
South Dakota State University
Christian Brothers University
Tennessee Tech. University
University of Tennessee - Chattanooga
Vanderbilt University
Rice University
St. Mary's University
Texas A & I University
*Trinity University
University of Houston
University of Texas - Arlington
University of Texas - Austin
University of Texas - El Paso
Brigham Young University
University of Utah
Utah State University
Old Dominion University
University of Virginia
Virginia Military Institute
Virginia Polytechnic Inst. & State U.
*Washington and Lee University
Gonzaga University
Seattle University
*Walla Walla College
Washington State University
West Virginia Institute of Technology
*West Virginia University
Milwaukee School of Engineering
University of Wisconsin - Madison

Technology Schools

University of Alabama
Pima Community College
Phoenix College
Southern Arkansas University
University of Arkansas at Little Rock
California State Polytechnic University
California State University
Cogswell Polytechnic College
Cuyamaca College
University of Southern Colorado
Greater New Haven State Technical College
Norwalk State Technical College
University of Hartford
Central Connecticut State College
Thames Valley State Technical College
Brevard Community College
University of Central Florida
Hillsborough Community College
Miami-Dade Community College - South Campus
Palm Beach Community College
St. Petersburg Junior College
Tampa Technical Institute
University of Florida
University of North Florida
*Devry Institute of Technology at Atlanta
Georgia Southern College
Savannah State College
Southern Technical Institute
Idaho State University
Ricks College
Bradley University
Eastern Illinois University
Illinois State University
Morrison Institute of Technology
Parkland College
Southern Illinois University
Western Illinois University
Indiana State University - Evansville
Indiana State University - Terre Haute
Indiana - Purdue University at Indianapolis
ITT Technical Institute
Purdue University - Calumet
Purdue University - School of Technology
Purdue University - West Lafayette
Clinton Community College
*North Iowa Area Community College
Iowa State University
Iowa Western Community College
Hawkeye Institute of Technology
North Iowa Area Community College
*Western Iowa Technical Community College
Kansas State University
Wichita State University
Murray State University
*University of Louisville
Louisiana Technical University
University of Maryland
Central New England College
North Shore Community College
Northeastern University
Quinsigamond Community College
Southeastern Massachusetts University
Delta College
Michigan Technologic University
Montcalm Community College
Northern Michigan University
Anoka - Ramsey Community College
Wayne State University
Western Michigan University
Mankato State University
Moorhead State University
Northwestern Electronics Institute

Rochester Community College
Southwest State University
Jackson State University
University of Southern Mississippi
Jefferson College
Missouri Institute of Technology
Missouri Western State College
Northeast Missouri State University
St. Louis Community College
Kearney State College
University of Nebraska
Middlesex County College
New Jersey Institute of Technology
Trenton State College
Union College
Union County Technical Institute
Mercer County Community College
New Mexico State University
Broome Community College
Hudson Valley Community College
Bronx Community College of CUNY
City College of CUNY
Dutchess County Community College
Mohawk Valley Community College
National Technical Institute for the Deaf
New York City Community College
New York Institute of Technology
Niagara County Community College
Orange County Community College
Queensborough Community College
Rochester Institute of Technology
SUNY - Buffalo
SUNY - A & T - Alfred
SUNY - A & T - Morrisville
SUNY College of Technology at Utica/Rome
*Westchester Community College
Asheville Buncombe Tech Institute
Cape Fear Technical Institute
Guilford Technical Institute
North Carolina A & T University
Pitt Technical Institute
University of North Carolina-Charlotte
*Rowan Technical Institute
Surry Community College
Columbus Technical Institute
Franklin University
Michael J. Owens Technical College
Lakeland Community College
*Tetra Technical College
Miami University
Oklahoma State Technical Institute
*Northeastern Oklahoma State University
Chemeketa Community College
Community College of Allegheny County
Oregon Institute of Technology
Cannon College
Pennsylvania State University
Pennsylvania Technical Institute
Pittsburgh Technical Institute
Roger Williams College
*Denmark Technologic Education Center
Midlands Technical College
*South Carolina State College
Tri-County Technical College
*Lake Area Vocational - Technical Institute
Mitchell Area Vocational - Technical School
*South Dakota State University
Chattanooga State Technical Community College
Middle Tennessee State University
Nashville State Tech.
Tennessee Technical University
Amarillo College
Texas Southern University
Texas State Tech. - Rio Grande Campus
University of Houston
*Southern Utah State College
Utah State University
Webster State College
Thomas Nelson Community College
Norwich University
Vermont Technical College
Old Dominion University
Virginia Polytechnical Institute
*Virginia State University
Yakima Valley Community College
Bluefield State College
*West Virginia Institute of Technology
Gateway Technical Institute
Milwaukee School of Engineering

*Did not provide starting salary data.

AMERICAN ASSOCIATION
OF ENGINEERING SOCIETIES
345 EAST 47th STREET
NEW YORK, NEW YORK 10017 TELEPHONE 212-644-7840

May 1980

MEMBER SOCIETIES
American Society of Civil Engineers
American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.
The American Society of Mechanical Engineers
The Institute of Electrical & Electronics Engineers
American Society for Engineering Education
American Society of Heating, Refrigerating & Air-Conditioning Engineers, Inc.
American Society of Agricultural Engineers
American Institute of Chemical Engineers
National Council of Engineering Examiners
Society of Manufacturing Engineers
National Society of Professional Engineers
National Institute of Ceramic Engineers
Society of Plastics Engineers, Inc.
American Society for Quality Control
Standards Engineers Society
American Institute of Industrial Engineers, Inc.
Society of Fire Protection Engineers
Society of Women Engineers
American Institute of Plant Engineers
American Association of Cost Engineers

ASSOCIATE SOCIETIES
Air Pollution Control Association
American Society for Metals
The Society of American Military Engineers
Society of Allied Weight Engineers, Inc.
American Congress on Surveying & Mapping
National Association of Corrosion Engineers
Society of Packaging and Handling Engineers
International Material Management Society
American Society of Gas Engineers
American Academy of Environmental Engineers
American Consulting Engineers Council

REGIONAL SOCIETIES
Western Society of Engineers
The Cleveland Engineering Society
Engineering Society of Detroit
Washington Society of Engineers
Engineering Societies of New England, Inc.
International Material Management Society, New Jersey Chapter, Inc.
Danville Engineers Club

To Deans, Department Chairmen, and Placement Directors:

We are pleased to invite you to participate in the Engineering Manpower Commission's 1980 Placement Survey of Engineering and Technology graduates. As in the past, each participant will receive a complimentary summary when the survey has been completed.

In order to participate, please complete the enclosed survey forms according to the instructions and return them to the Engineering Manpower Commission in the postpaid return envelope provided. Please make an effort to respond by June 1, 1980, in any event not later than July 1, 1980.

Once again, we are splitting the graduate study responses (column 3) into those pursuing a technical graduate degree and those pursuing a non-technical graduate degree. This year for the first time, we are asking for an indication of starting salaries (not offers) for engineering graduates. We ask that your attention be directed to this particular item, since it is planned to make a comparison between starting salaries paid and salary offers as reported by the College Placement Council. Finally, because of growing national interest in entrepreneurship and innovation, we are making a preliminary effort to find out how many engineering and technology graduates are attempting to start their own businesses. Please use the enclosed form for supplying this information.

Based on last year's results, we have expanded the survey to include additional pre-printed curriculum titles. As in the past, please feel free to include your own curricula designations.

For those of you who are familar with the previous format, we would like to call your attention to the fact that some changes have been made in the positioning of the columns. Column 8 is the summation of columns 1 - 7 inclusive.

We are making every effort to make the 1980 Placement Survey of Engineering and Technology graduates an accurate, timely and useful instrument for colleges, students and organizations who are interested in recruiting technical employees. Please verify your response to be certain that data reported is correct and that column entries equal the row total as indicated.

We trust that this year's survey will be most successful and look forward to receiving your response. If you wish to discuss this survey or have any questions, please telephone or write.

Sincerely,

Patrick J. Sheridan

Patrick J. Sheridan
Manager, Manpower Activities

PJS/rb
Enc.

12

Form A

THE PLACEMENT OF ENGINEERING GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** _____

Tel. No. ( ) 184 Schools **Please note any address corrections, if necessary, on the mailing label on the reverse of this form.**

Please complete the form below for all engineering graduates of the current graduating class. Use a **separate sheet** for each degree level(bachelor, master, or doctor.) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation**, which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL BACHELORS

Engineering Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study*		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech	Non Tech					
Aerospace	266	15	49	3	32	23	11	62	461
Agricultural	212	1	46	4	19	9	29	59	379
Architectural	153	12	11	8	16	13	78	85	376
Ceramic	109	1	43	0	7	2	24	5	191
Chemical	2349	17	301	45	124	52	152	606	3646
Civil	2528	74	403	28	152	131	229	1008	4553
Computer	569	7	63	4	51	9	23	227	953
Electrical-Electronic	4009	137	558	62	274	124	211	1112	6487
Engineering, General	274	6	179	9	28	20	21	66	603
Eng. Sci, Phys., Mech.	190	5	104	6	25	22	21	91	464
Industrial, Mgt., Mfg.	814	20	98	16	39	31	59	216	1293
Materials Sci. & Engrg.	138	3	34	2	9	4	11	52	253
Mechanical	4102	72	461	43	269	96	210	979	6232
Metallurgical	254	3	54	4	19	21	24	48	427
Min., Geol., Geoph.	1078	54	143	22	75	26	88	294	1780
Naval Arch., Marine, Ocean	9	0	1	0	5	0	0	0	15
Nuclear	52	6	32	0	0	1	0	22	113
Petroleum	91	1	0	0	0	0	1	11	104
Systems	36	0	9	1	0	0	5	31	82
OTHER	366	25	52	8	25	10	38	238	762
TOTAL OF ABOVE	17599	459	2641	265	1169	594	1235	5212	29174

If data are available, please break out data for women and minority graduates (all engineering curricula combined) in the lines below.

Women	1143	25	141	19	89	36	40	218	1711
Blacks	227	13	18	5	13	4	4	55	339
Hispanics	148	9	8	2	13	1	5	471	656
Asian-Pacific	135	3	35	6	13	9	8	118	327
American Indian	16	0	4	1	0	0	0	2	23

*Include students entering full-time graduate study at employer's expense. Students employed in an academic capacity (teaching and research assistant) incidental to graduate study should be included in Column 3 only.

PLEASE COMPLETE AND RETURN THIS FORM AS SOON AS POSSIBLE, PREFERABLY BY JUNE 1, BUT NOT LATER THAN JULY 1, 1980.

When completed send to Engineering Manpower Commission • 345 East 47th Street • New York, New York 10017

Form A

THE PLACEMENT OF ENGINEERING GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** _____

Tel. No. ( ) 106 Schools

Please note any address corrections, if necessary, on the mailing label on the reverse of this form.

Please complete the form below for all engineering graduates of the current graduating class. Use a **separate sheet** for each degree level (bachelor, master, or doctor.) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation**, which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL MASTERS

Engineering Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study*		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech	Non-Tech					
Aerospace	20	7	16	0	2	4	0	19	68
Agricultural	14	1	7	1	2	0	0	8	33
Architectural	17	1	6	0	3	0	0	22	49
Ceramic	6	1	0	0	0	0	2	1	10
Chemical	216	16	43	1	20	3	9	86	394
Civil	273	87	60	5	21	10	10	208	674
Computer	81	23	25	0	12	4	2	136	283
Electrical-Electronic	361	53	94	1	27	13	3	333	885
Engineering, General	19	2	0	3	6	1	0	22	53
Eng. Sci. Phys., Mech.	11	1	49	0	0	0	0	14	75
Industrial, Mgt., Mfg.	99	32	16	0	4	1	4	86	242
Materials Sci. & Engrg.	18	1	9	0	2	0	2	11	43
Mechanical	204	34	44	3	14	11	8	102	420
Metallurgical	23	4	10	0	1	0	1	23	62
Min., Geol., Geoph.	81	2	16	0	1	2	0	20	122
Naval Arch., Marine, Ocean	3	0	0	0	1	0	0	1	5
Nuclear	19	2	12	0	2	0	0	18	53
Petroleum	9	5	2	0	1	1	0	16	34
Systems	26	8	8	2	3	0	0	27	74
OTHER	126	43	38	0	17	3	5	75	307
TOTAL OF ABOVE	1626	323	455	16	139	53	46	1228	3886

If data are available, please break out data for women and minority graduates (all engineering curricula combined) in the lines below.

Women	83	10	16	1	7	2	2	25	146
Blacks	18	2	1	0	0	0	0	4	25
Hispanics	13	4	4	1	0	0	0	8	30
Asian-Pacific	75	5	22	0	7	6	5	74	194
American Indian	1	0	0	0	0	0	0	0	1

*Include students entering full-time graduate study at employer's expense. Students employed in an academic capacity (teaching and research assistant) incidental to graduate study should be included in Column 3 only.

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When completed send to Engineering Manpower Commission • 345 East 47th Street • New York, New York 10017

Form A

THE PLACEMENT OF ENGINEERING GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** _____

Tel. No. ( ) 67 Schools

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Please complete the form below for all engineering graduates of the current graduating class. Use a **separate sheet** for each degree level (bachelor, master, or doctor.) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation**, which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL DOCTORATE

Engineering Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study*		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech	Non-Tech					
Aerospace	12	1	0	0	0	0	0	10	23
Agricultural	12	0	0	0	0	0	0	3	15
Architectural	0	0	0	0	0	0	0	0	0
Ceramic	3	1	0	0	0	1	0	2	7
Chemical	81	7	0	0	1	0	2	39	130
Civil	57	13	1	0	3	4	0	36	114
Computer	25	8	0	0	0	1	0	15	49
Electrical-Electronic	86	12	0	0	5	1	3	63	170
Engineering, General	8	0	0	0	1	0	0	3	12
Eng. Sci, Phys., Mech.	34	3	0	0	2	12	1	23	75
Industrial, Mgt., Mfg.	15	0	0	0	0	1	0	9	25
Materials Sci. & Engrg.	23	0	0	0	0	2	2	3	30
Mechanical	46	19	0	0	2	1	0	33	101
Metallurgical	18	1	0	0	0	0	0	9	28
Min., Geol., Geoph.	17	1	0	0	0	0	0	1	19
Naval Arch., Marine, Ocean	0	0	0	0	0	0	0	0	0
Nuclear	12	3	1	0	0	0	0	5	21
Petroleum	3	1	0	0	0	0	0	1	5
Systems	15	0	0	0	0	0	1	2	18
OTHER	64	8	0	0	2	0	2	5	81
TOTAL OF ABOVE	531	78	2	0	16	23	11	262	923

If data are available, please break out data for women and minority graduates (all engineering curricula combined) in the lines below.

Women	12	3	1	0	1	0	1	1	19
Blacks	3	0	0	0	1	0	0	0	4
Hispanics	1	0	0	0	0	0	0	0	1
Asian-Pacific	23	1	0	0	2	0	0	5	31
American Indian	0	1	0	0	0	0	0	0	1

*Include students entering full-time graduate study at employer's expense. Students employed in an academic capacity (teaching and research assistant) incidental to graduate study should be included in Column 3 only.

PLEASE COMPLETE AND RETURN THIS FORM AS SOON AS POSSIBLE, PREFERABLY BY JUNE 1, BUT NOT LATER THAN JULY 1, 1980.

When completed send to Engineering Manpower Commission • 345 East 47th Street • New York, New York 10017

To Deans, Department Chairmen and Directors of College Placement:

This year the Engineering Manpower Commission of American Association of Engineering Societies is conducting its twenty-first survey of the placement status of engineering and technology graduates. Because of the excellent cooperation we have received from you in the past, our surveys are widely recognized as the most comprehensive and authoritative of their kind.

The survey form on the reverse of this sheet has been modified slightly to make the reporting categories more useful, but it is generally the same as previous years' forms. Separate forms are provided for the following groups of students:

Form A — Engineering graduates
Form B — Engineering Technology and Industrial Technology graduates
Form C — Technician and Technologist Starting Salaries
Form D — Engineering Graduates Starting Salaries

This form is for **engineering graduates** only. Please use a **separate sheet** for each degree level (bachelor's, master's, engineer, or doctor's degree) and be sure to fill in the space for degree level at the top of the form. If you need more copies of the form than were provided, please contact EMC at once (212-644-7847). Be sure to return the copy with the mailing label affixed below.

Note the following **important instructions** in filling out the forms:

1. Report placement status as of the time of graduation at your institution.
2. The placement status columns (1-7) should add up to the total in column 8.
3. Group closely related curricula together. Use blank lines for curricula not listed.

Since a major objective of this survey is the timely publication of statistical data, your cooperation in reporting promptly and accurately is essential. Please use your best estimates if necessary so that you may return your report by no later than July 1.

Individual replies to the placement survey are not disclosed. Only composite statistics will be released. All respondents will be sent a complimentary summary of the survey results.

Thank you in advance for your cooperation.

ENGINEERING MANPOWER COMMISSION PLACEMENT SURVEY

Please indicate address corrections below, if necessary.

All correspondence will be directed to the person indicated on the mailing label.

FORM A

Form B

THE PLACEMENT OF TECHNOLOGY GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** _____

Tel. No. ( ) 54 Schools

Please note any address corrections, if necessary, on the mailing label on the reverse of this form.

Please complete the form below for all technology graduates of the current graduating class. Use a **separate sheet** for each degree level(associate or bachelor of technology.) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation**, which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL ASSOCIATE

Technology Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech	Non-Tech					
Aerospace Eng. Tech.	20	2	14	0	0	0	5	1	42
Air Conditioning Tech.	30	1	8	0	9	4	18	0	70
Architectural Eng. Tech.	100	19	106	12	13	10	42	62	364
Automotive Eng. Tech.	53	11	38	0	3	2	21	38	166
Civil Eng. Tech.	158	22	118	3	15	13	54	11	394
Chem. Eng. Tech.	39	6	15	4	3	1	21	29	118
Computer Tech.	169	3	81	4	4	12	55	130	458
Drafting & Design Tech.	173	10	77	0	19	1	20	15	315
Electrical Eng. Tech.	273	17	96	2	8	10	53	114	573
Electronics Eng. Tech.	368	50	114	0	33	70	36	87	758
Industrial Technology	39	4	19	0	1	3	4	14	84
Manufacturing Tech.	15	12	7	0	0	3	5	1	43
Mechanical Eng. Tech.	248	28	177	0	6	8	36	83	586
Nuclear Technology	25	0	7	0	0	0	4	2	38
OTHER	237	88	79	0	40	34	51	128	657
TOTAL OF ABOVE	1947	273	956	25	154	171	425	715	4666
2-Year Pre-Engineering*									

If data are available, please break out data for women and minority graduates (all technology curricula combined) in the lines below.

Women	153	2	31	0	4	4	32	55	281
Blacks	58	1	20	0	1	10	3	50	143
Hispanics	57	1	13	0	3	5	4	10	93
Asian-Pacific	20	2	6	0	2	10	3	1	44
American Indian	4	0	0	0	0	0	0	0	4

*2-Year engineering programs are usually considered non-terminal, but since many graduates do not continue full-time study, we are seeking information on the status of this group.

PLEASE COMPLETE AND RETURN THIS FORM AS SOON AS POSSIBLE, PREFERABLY BY JUNE 1, BUT NOT LATER THAN JULY 1, 1980.

When completed send to Engineering Manpower Commission • 345 East 47th Street • New York, New York 10017

Form B

THE PLACEMENT OF TECHNOLOGY GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** NON-ACCREDITED

Tel. No. ( ) 56 Schools

Please note any address corrections, if necessary, on the mailing label on the reverse of this form.

Please complete the form below for all technology graduates of the current graduating class. Use a **separate sheet** for each degree level(associate or bachelor of technology.) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation,** which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL ASSOCIATE

Technology Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech	Non-Tech					
Aerospace Eng. Tech.	0	0	0	0	0	0	0	0	0
Air Conditioning Tech.	83	4	4	0	2	3	2	8	106
Architectural Eng. Tech.	113	11	40	0	6	5	5	6	186
Automotive Eng. Tech.	115	8	18	1	9	6	16	13	186
Civil Eng. Tech.	67	5	10	0	21	5	12	13	133
Chem. Eng. Tech.	9	0	0	0	1	1	1	2	14
Computer Tech.	81	4	20	0	16	5	21	22	169
Drafting & Design Tech.	137	9	17	1	14	4	20	20	222
Electrical Eng. Tech.	102	3	13	0	12	2	10	11	153
Electronics Eng. Tech.	442	31	18	1	22	28	34	53	629
Industrial Technology	0	0	0	0	0	0	0	0	0
Manufacturing Tech.	26	7	2	0	10	4	1	0	50
Mechanical Eng. Tech.	128	15	18	0	21	1	26	12	221
Nuclear Technology	0	1	0	0	1	0	0	0	2
OTHER	48	9	8	1	3	2	13	20	104
TOTAL OF ABOVE	1351	107	168	4	138	66	161	180	2175
2-Year Pre-Engineering*									

If data are available, please break out data for women and minority graduates (all technology curricula combined) in the lines below.

Women	104	10	7	1	5	11	13	9	160
Blacks	48	13	4	0	8	12	8	15	108
Hispanics	36	75	3	5	3	20	3	19	164
Asian-Pacific	13	4	3	0	3	0	0	8	31
American Indian	8	0	0	0	5	0	6	2	21

*2-Year engineering programs are usually considered non-terminal, but since many graduates do not continue full-time study, we are seeking information on the status of this group.

PLEASE COMPLETE AND RETURN THIS FORM AS SOON AS POSSIBLE, PREFERABLY BY JUNE 1, BUT NOT LATER THAN JULY 1, 1980.

When completed send to Engineering Manpower Commission • 345 East 47th Street • New York, New York 10017

Form B

THE PLACEMENT OF TECHNOLOGY GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** _____

Tel. No. ( ) 38 Schools

Please note any address corrections, if necessary, on the mailing label on the reverse of this form.

Please complete the form below for all technology graduates of the current graduating class. Use a **separate sheet** for each degree level(associate or bachelor of technology.) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation**, which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL BACHELORS

Technology Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech	Non-Tech					
Aerospace Eng. Tech.	3	3	2	0	1	0	0	1	10
Air Conditioning Tech.	16	1	0	0	0	0	4	0	21
Architectural Eng. Tech.	51	11	10	4	5	2	23	93	199
Automotive Eng. Tech.	15	3	2	0	0	0	0	2	22
Civil Eng. Tech.	198	9	11	1	13	3	19	68	322
Chem. Eng. Tech.	8	0	0	0	2	0	2	0	12
Computer Tech.	58	2	0	0	0	0	9	32	101
Drafting & Design Tech.	34	1	0	0	0	0	7	1	43
Electrical Eng. Tech.	398	28	4	6	30	5	36	202	709
Electronics Eng. Tech.	271	16	6	0	9	7	29	61	399
Industrial Technology	286	102	9	2	15	0	19	165	598
Manufacturing Tech.	61	2	2	2	2	2	7	4	82
Mechanical Eng. Tech.	324	11	11	0	47	4	45	117	559
Nuclear Technology	0	0	0	0	0	0	0	0	0
OTHER	292	28	8	4	23	5	39	53	452
TOTAL OF ABOVE	2015	217	65	19	147	28	239	799	3529
2-Year Pre-Engineering*									

If data are available, please break out data for women and minority graduates (all technology curricula combined) in the lines below.

Women	56	2	0	0	2	4	5	26	95
Blacks	47	3	2	3	4	1	1	24	85
Hispanics	19	0	1	0	0	0	1	1	22
Asian-Pacific	16	0	2	0	1	0	2	4	25
American Indian	1	0	0	0	0	0	0	0	1

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Form B

THE PLACEMENT OF TECHNOLOGY GRADUATES—JUNE 1980

Name of School ALL RESPONDENTS **Reporting Official** NON-ACCREDITED

Tel. No. ( ) 47 Schools

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Please complete the form below for all technology graduates of the current graduating class. Use a **separate sheet** for each degree level(associate or bachelor of technology) DO NOT INCLUDE EVENING STUDENTS or FOREIGN STUDENTS. The data should be based on the situation prevailing **as of the date of graduation**, which will vary among schools. A summary of the results will be mailed to all participants.

DEGREE LEVEL BACHELOR'S OF TECHNOLOGY

Technology Curriculum or Option (write in those not listed)	1 Has Accepted Job Offer	2 Returning to a Previous Job	3 Entering Full-Time Graduate Study		4 Has Job Offer but Still Undecided	5 Other Plans — not Seeking Employment	6 No Job Offers or Other Plans — Seeking Employment	7 No Information	8 TOTAL — Sum of Cols. 1-7
			Tech.	Non-Tech.					
Aerospace Eng. Tech.	4	1	0	0	0	0	0	7	12
Air Conditioning Tech.	12	3	1	0	1	0	0	0	17
Architectural Eng. Tech.	24	0	3	0	0	1	28	78	134
Automotive Eng. Tech.	7	0	0	0	0	0	0	12	19
Civil Eng. Tech.	32	1	2	0	0	0	15	17	67
Chem. Eng. Tech.	0	0	0	0	0	0	0	0	0
Computer Tech.	17	0	0	0	0	0	0	0	17
Drafting & Design Tech.	26	4	0	0	5	0	3	19	57
Electrical Eng. Tech.	44	14	1	1	6	0	5	35	106
Electronics Eng. Tech.	105	9	0	0	7	3	6	43	173
Industrial Technology	212	39	5	0	7	6	27	82	378
Manufacturing Tech.	40	15	1	0	4	0	3	15	78
Mechanical Eng. Tech.	98	22	1	0	10	0	8	49	188
Nuclear Technology	12	0	0	0	0	0	0	0	12
OTHER	183	11	8	5	8	2	25	66	308
TOTAL OF ABOVE	816	119	22	6	48	12	120	423	1566
2-Year Pre-Engineering*									

If data are available, please break out data for women and minority graduates (all technology curricula combined) in the lines below.

Women	58	0	0	1	1	0	2	10	72
Blacks	96	3	2	0	0	4	1	3	109
Hispanics	7	1	0	0	0	0	0	4	12
Asian-Pacific	5	0	0	0	0	0	0	0	5
American Indian	0	0	0	0	0	0	0	0	0

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Form C — Technician and Technologist Starting Salaries
Form D — Engineering Graduates Starting Salaries

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ENGINEERING MANPOWER COMMISSION PLACEMENT SURVEY

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FORM B

Entrepreneurship and Innovation

As I'm sure you are well aware, there is a growing concern that over the past decade, the U.S. has been lagging behind a number or other industrialized nations in commercializing new high-technology ideas into useful products or services. Various efforts are being made to educate and motivate engineering students to undertake the role of the entrepreneur in building a business enterprise around a novel and potentially useful idea.

In view of this, we feel that it is important to learn to what extent engineering graduates, in a statistically significant number, are entering this area of development. Please report below any activity along these lines you have noted at your institution.

212 SCHOOLS REPORTED
Reporting Institution

Name of Reporting Individual

1. Does your institution offer course work in Innovation and Entrepreneurship?

   Yes 19 No 193

2. If your answer to question one is yes, how many such courses are you currently offering?

   (4 schools offered E & I material as part of other courses)
   36 courses

3. If you answered NO to question one, are you currently planning to offer such coursework?

   Yes 10 No 179 schools
   schools

4. How many of your 1980 graduates are attempting to form their own companies?

   124 Graduates (from 35 schools)

5. How many of your 1980 graduates are joining companies of less than 50 employees?

   848 Graduates (from 75 schools)

NOTES

AAES

MEMBER SOCIETIES

American Society of Civil Engineers	1852
American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.	1871
The American Society of Mechanical Engineers	1880
The Institute of Electrical & Electronics Engineers	1884
American Society for Engineering Education	1893
American Society of Heating, Refrigerating & Air-Conditioning Engineers, Inc.	1894
American Society of Agricultural Engineers	1907
American Institute of Chemical Engineers	1908
American Society for Metals	1913
National Council of Engineering Examiners	1920
Society of Manufacturing Engineers	1932
National Society of Professional Engineers	1934
National Institute of Ceramic Engineers	1938
Society of Allied Weight Engineers, Inc.	1939
Society of Plastics Engineers, Inc.	1941
American Society for Quality Control	1946
Standards Engineering Society	1947
American Institute of Industrial Engineers, Inc.	1948
Society of Women Engineers	1950
Society of Fire Protection Engineers	1950
American Institute of Plant Engineers	1954
American Nuclear Society	1954
American Academy of Environmental Engineers	1955
American Association of Cost Engineers	1956
System Safety Society	1962
Association of Energy Engineers	1977
American Indian Science & Engineering Society	1977

ASSOCIATE SOCIETIES

Air Pollution Control Association	1907
American Congress on Surveying & Mapping	1941
National Association of Corrosion Engineers	1945
Federation of Materials Societies	1972

REGIONAL SOCIETIES

Western Society of Engineers	1869
The Cleveland Engineering Society	1880
Engineering Society of Detroit	1895
Washington Society of Engineers	1905
Colorado Society of Engineers	1916
Colorado Engineering Council	1919
Engineering Societies of New England, Inc.	1923

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AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES
345 East 47th Street
New York, New York 10017
(212) 644–7840